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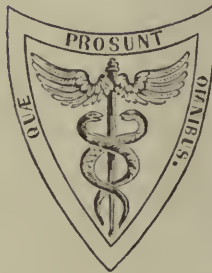
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EDITED BY

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Contributors who wish their articles to appear in the next number are requested to forward them before the 1st of February.

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In order to accommodate the pressure upon our columns for space, sixteen pages have been added to this number.

The following works have been received:—

La Syphilis, son Histoire et son Traitement (Méthode Anglaise). Par le Dr. JAMES TARTENSON. Deuxième éd. Paris : J. B. Baillière et Fils, 1880.

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Beitrag zur Lehre von der Innervation des Uterus. Von Dr. G. REIN. Bonn, 1880.

Ueber Sigmatismus und Parasigmatismus. Von Dr. ARTHUR HARTMANN, in Berlin.

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- Hernia in Children. By EDWARD SWASEY, M.D. New York, 1880.
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- Pilocarpin in Intermittent Fever. By GASPAR GRISWOLD, M.D. New York, 1880.
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- Experts and Expert Testimony. By JOHN B. CHAPIN, M.D. 1880.
- Reprints of Papers upon Gynecological Subjects. By JOHN GOODMAN, M.D., Prof. of Obstetrics, Louisville Med. Coll. Louisville, 1880.
- Enumeration, Classification, and Causation of Idiocy. By ISAAC N. KERLIN, M.D. Philadelphia, 1880.
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- Clinical Observations on the Radical Treatment of Fibroid Tumours of the Womb. By WILLIAM GOODELL, M.D. Philadelphia, 1880.
- If a Woman has Ruptured her Uterus during Labour, what should be Done in order to Save Life? By ROBERT P. HARRIS, M.D. New York, 1880.
- The Dangers Incident to the Simplest Uterine Manipulations and Operations. By GEO. J. ENGELMANN, M.D., St. Louis, Mo. St. Louis, 1880.
- Seven Cases of Retroflexion of the Uterus, with Peritoneal Adhesions of the Fundus in the Hollow of the Sacrum, Treated by Forceful Separation of Adhesions. A Device to Facilitate the Removal of Deep Wire Sutures in the Operation for Ruptured Perineum. A Contribution to the Relative Value of the Different Operations for Delivery in Narrow Pelves. By AUG. F. ERICH, M.D. Baltimore.
- A Case of Combined Intrauterine and Abdominal Twin Pregnancy. By H. P. C. WILSON, M.D. New York, 1880.
- Suggestions as to the Therapeutic Value of Rest in the Treatment of Laryngeal Diseases. By BEVERLEY ROBINSON, M.D. New York.
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- Atresia of the Genital Passages of Women. By EDWARD W. JENKS, M.D.
- General Sanitation. Regulation of Medical Practice. By HENRY B. BAKER, M.D.
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- Light in the Public Schools and School Life in Relation to Vision. By C. J. LUNDY, M.D. Lansing, 1880.
- The "Abdominal Method" of Singing and Breathing as a Cause of Female Weaknesses. By CLIFTON E. WING, M.D. Boston.
- Feigned Epilepsy. By CARLOS F. MACDONALD, M.D.
- The Pathology and Treatment of Epulis. By N. SENN, M.D., of Milwaukee.
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- Transactions of the Medical Association of Georgia, 1880. Atlanta, 1880.
- Transactions of the Medical Association of Alabama, 1880. Montgomery, 1880.
- Transactions of the New Hampshire Medical Society for 1880. Concord, 1880.
- Transactions of the American Otological Society, 1880. Boston, 1880.
- Proceedings of the Medical Society of the County of Kings, Oct., Nov., Dec., 1880.
- Proceedings of the Academy of Nat. Sciences of Philadelphia, April to Sept., 1880.
- Report relating to the Registry and Return of Births, Marriages, and Deaths, in Michigan, for the year 1874. Lansing, 1880.
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Medizinische Jahrbücher, 1880. Heft III.

Centralblatt für die Medicinischen Wissenschaften. Nos. 23 to 48, 1880.

Allgemeine Wiener Medizinische Zeitung. Nos. 22 to 47, 1880.

Deutsche Medicinische Wochenschrift. Nos. 23 to 47, 1880.

Medicinisch-Chirurgisches Centralblatt. Nos. 18 to 48, 1880.

Bibliothek för Læger. Bd. X., Heft 3, 4.

Nordiskt Medicinskt Arkiv. Bd. XII., No. 8.

Upsala Läkareförenings Förhandlingar. Bd. XV., Nos. 6, 7, 8. Bd. XVI., No. 1.

Annali Universali di Medicina e Chirurgia. Aprile to Ottobre, 1880.

L'Imparziale. Nos. 10 to 22, 1880.

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Giornale Italiano delle Malattie Veneree e della Pelle. Giugno, Ottobre, 1880.

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Annales de Dermatologie et de Syphiligraphie. Tome I., Nos. 3, 4.

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Annales des Maladies de l'Oreille et du Larynx. Juin, Sept., Nov. 1880.

Bulletin Générale de Thérapie. Juin to Nov. 1880.

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Edinburgh Medical Journal. July to Dec. 1880.

The Glasgow Medical Journal. July to Dec. 1880.

The Dublin Journal of Medical Science. June to Oct. 1880.

The Royal London Ophthalmic Hospital Reports. Aug. 1880.

The Australian Medical Journal. May to Oct. 1880.

The usual American exchanges have been received; their separate acknowledgment is omitted for want of space.

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1. Conférences Cliniques sur les Maladies du Larynx et des premières Voies. Par le Dr. Isambert. 8vo. pp. xi. 418. Paris, 1877.
 2. Die Laryngotomie zur Entfernung intralaryngealen Neubildungen. Von Prof. Paul Bruns. 8vo. pp. viii. 211. Berlin, 1878.
 3. Ueber Laryngoskopie und Rhinoskopie und ihre Anwendung in der ärztlichen Praxis. Von Johann Schnitzler. 8vo. pp. 62. Wien: Urban & Schwarzenburg, 1878.
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 5. Lessons in Laryngoscopy and Rhinoscopy; including the Diagnosis and Treatment of Diseases of the Throat and Nose. By Prosser James, M.D. Third. ed. 12mo. pp. viii. 162. London, 1879.
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Sclerosis of the Brain & Spinal Cord.

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ARTICLE I.

ANTERO-LATERAL SCLEROSIS.¹ By ANDREW FLEMING, M.D.,
of Pittsburgh, Pennsylvania.

DURING the past twenty years nervous diseases have engrossed a large share of the time and attention of some of the most prominent men of the profession, resulting already in a vast accumulation of important facts and a wide expansion of the area of practical knowledge. New and precise methods of investigation, hitherto unknown, have been discovered and invented within the last few years, which have partly revealed the mystery surrounding the pathology of the nervous system. Although the results have not been as satisfactory as could be desired, enough has already been accomplished to justify the expectation, that a much more intimate acquaintance with this abstruse subject will be ultimately acquired, and the diagnosis of nervous diseases at some future, but not distant time, will be made as certain, if not as plain, as that of the common exanthemata.

The best recent authorities teach that certain morbid changes take place in the nervous system within small, distinct, and occasionally circumscribed limits, with a series of well-marked correlative symptoms, by which, when carefully noted, the nature of the malady can be recognized with precision, and the exact seat of pathological alteration localized with assurance during life. When a defined portion of the nervous system becomes the nidus of disease or morbid degeneration, certain symptoms, corresponding in degree to the severity of the attack, will manifest themselves, which will be found to vary according as the nerves of sensation, of organic life, or muscular power may be invaded, and their function

¹ Address of the retiring President of the Allegheny County Medical Society, delivered March 18, 1879, and published by request of the Society.

likewise disturbed. If a given point of the spinal cord, for example, be enthralled, a distinctive group of effects will be produced, which, when formulated, will locate the lesion, and become entitled to a special appellation.

Unfortunately for ease of diagnosis, primary nervous lesions do not always remain either limited or stationary in their character. In these morbid processes there is a natural tendency to spread on one or on all sides, to become diffused; and it is easy to conceive that when this occurs in the brain or spinal marrow, a new tract of morbid alteration will be opened up, whereby, from their close proximity, nerves not originally involved will be injured in their origin or in their course, which will inevitably result in new and superadded pathological phenomena. All nerves, cerebral or spinal, are at times liable from direct or reflex cause to active and violent but simply functional disturbances, which often so thoroughly resemble those derangements caused by organic and fatal lesions as to very much embarrass the most experienced practitioner in distinguishing them. Familiarity with the grave and organic nervous disorders greatly tends to diminish this embarrassment.

The brain and the spinal cord are both subject to inflammation like that which attacks other parts of the body, and also to certain forms of degeneration, the result of inflammation or morbid nutrition, that from their special morphology may be said to be peculiar to these organs. Inflammation, whether of the meninges or parenchyma, may be acute or chronic. When of the latter it is called chronic myelitis.

Anatomically speaking, chronic myelitis will be found to terminate in two distinct well-known forms, viz., in foci of ramollissement and in points or patches of gray degeneration, known as sclerosis. Sclerosis, which is of late years regarded as one of the most common diseases of the cerebro-spinal centres, is not inclined to confine its ravages to either the brain or spinal cord, and it attacks both with equal impartiality. If in the brain, it shows a decided preference for the cortical portion, and, when in the cord, it manifests a predilection for the internal structure. In either there is a marked disposition to multiply when the deposit is punctate, and to become disseminated if it is in patches. When the posterior columns of the cord are affected by sclerosis, the disease is called posterior sclerosis, formerly known as *tabes dorsalis* and *locomotor ataxy*, names which were applied before its anatomical nature was fully understood, but unluckily are still retained; and, when the anterior columns are invaded, it is denominated antero-lateral sclerosis.

Pathology here, as in other instances, does not closely follow the ultimate divisions of structural anatomy which divides the spinal cord into three pairs of columns, the anterior, the lateral, and the posterior. Besides these six columns, of late years, the anterior white commissure, in front of the gray commissure at the bottom of the longitudinal fissure, and

the group of cells, devoid of cell processes, limited to the cervical portion of the spinal marrow, known as Clark's columns, whose specific function remains undiscovered, are recognized as separate constituents of the cord.

Although some morbid alterations of the brain and spinal cord, such as softening and atrophy, had been known and discoursed upon by Pinel, Abercrombie, Portal, Rostan, Solly, Gluge, and other psychologists, Cruveilhier was the first to describe the peculiar form of gray degeneration now designated sclerosis in his *Pathological Atlas*, the first volume of which was published in 1835. It is strange that the accurate drawing given by this distinguished observer remained so long unnoticed and unused. The unfortunate loss of the manuscript containing the history of the case delineated, may, in some measure, account for the neglect of this important discovery.

The earliest clinical observations, which were made by Müller in 1842, Rokitsansky in 1854, L. Türk in 1855, Frerichs and Valentiner (*Deutsche Klinik*) 1856, have since been indubitably confirmed with great exactitude of detail by Frommann, Duchenne, Vulpian, Charcot, Lockhart Clark, Jaccoud, Rindfleisch, Clymer, Bouchard, Gull, Moxon, and many others.

Several divisions have been made of sclerosis: circumscribed and general, and general sclerosis has been divided into regular or uniform and irregular or diffuse. It has been called multilocular, disseminated, insular, annular, *en plaques*, or in patches, according to the appearance and distribution of the various forms in which it may be found. A variety has been styled miliary by Drs. Batty Tuke and Rutherford (*Edinburgh Med. Journal*, 1868), from the resemblance of the spots to millet-seeds in their minuteness of size. No great scientific advantage is gained by such a multiplicity of terms, and only a portion of them is of technical value. The morbid alteration is essentially the same, though differing in the precise form it may assume. The variations are produced by the nearly always slow and gradual transformation of healthy into morbid structure, whereby one element of nerve substance is altered or wholly destroyed and another is increased in size by the infarction of morbid material, thus impairing the perfect harmony essential to normal physiological action. The process has been likened to the phenomenon of crystallization, in which the particles are first deposited in a soft and gelatinous condition, to be afterwards transformed into hard masses, variable in shape and size.

Sclerosis may invade the cerebrum, cerebellum, the pons Varolii, the corpora striata, the walls of the ventricles, the bulbus rachidicus, and the nerves themselves. It is not often associated with any other disease, but it has been found combined with atrophy of one of the cerebral hemispheres, as observed in two cases, one reported by Schule (*Archiv für Klin. Med.*, 1871) and the other by Rosenthal in his excellent "Treatise on Nervous Diseases." The extent of its ravages may be greater in the

motor tract of the spine in one case and in the sensory in another, without being exclusively confined to either at the same time.

Antero-lateral sclerosis is rarely found limited to a recognized anatomical region, but nearly always exhibits a tendency to become disseminated. Its common method of procedure is to travel from its primary seat, and the terms descending and ascending sclerosis have been employed to describe the direction taken in a given case. It is a disease of gradual and almost imperceptible invasion, having trifling prodromata; beginning with muscular rigidity and weakness of one or both lower limbs; associated, as it progresses, with rhythmic tremor of the muscles of the body on voluntary movement, and increasing debility of the lower limbs, soon passing into complete paralysis, which, when the disorder is fully developed, extends to the muscles of the upper extremities, the head, neck, pharynx, and tongue, and terminates in permanent contraction of one or more of the limbs, preceded or accompanied by apoplecticiform seizures or epileptiform convulsions.

Paralysis is commonly associated in the mind with the afflictions which beset advanced life, but antero-lateral sclerosis is strikingly exceptional in this respect, as it is most frequently seen in the young, from the age of eighteen to forty, and is seldom found at a much later period of life. The large number of cases which have been already published in the medical periodicals, do not show any decided preference for either sex, but the most experienced authorities claim that females are most liable to attack.

Etiology.—From personal observation, Guérard believes the disease to be capable of transmission, and a more calamitous inheritance it is hardly possible to imagine.

Among the causes productive of sclerosis, are venereal excesses, pregnancy rapidly and frequently repeated, excessive mental and muscular effort when greatly protracted, and severe fevers. A common cause is exposure to cold, by which is not meant the sudden effect of a blast of freezing wind on the body for a short time, but a prolonged exposure either from the nature of a daily occupation, or from living in a cold, damp, and insecure dwelling. Onanism, especially in the erect posture, is generally placed as the most frequent in the list of direct causes of sclerosis, yet when the universal prevalence of this unnatural method of sexual indulgence is duly considered, this would seem to be very improbable. If onanism constituted its greatest cause, the number of victims of sclerosis would be legion. Sclerosis may supervene on malaria, chronic rheumatism, gout, syphilis, alcoholism, and caries or injuries of the vertebrae.

From the occasional occurrence of sclerosis after the disappearance of certain skin diseases, such as eczema and chronic herpes, it was for a time supposed that the retrocession of the eruption was one of its natural causes, but an enlarged experience has altogether dissipated this supposi-

tion. The eruption is now regarded as purely of trophic character, and is merely the external sign of an existing dyscrasia, and the unwelcome harbinger of coming trouble.

Symptoms.—In a disease subject to such widely-marked variations as antero-lateral sclerosis, the study of the symptoms of any one case, in the succession in which they occur, would give but a limited view of its essential characteristics. To obtain a thorough knowledge of its symptomatology, its various and changing phases must be studied in careful detail.

A general feeling of malaise, accompanied by a slight fever, which may last for several days, with more or less cerebral disturbance, such as is often seen in the commencement of typhoid fever, are the initial symptoms of antero-sclerosis. These are often so slight that they are overlooked, and their importance is only fully appreciated during the progress of a case.

At the onset, should the cerebral symptoms predominate, there are headache, periodic neuralgia, dizziness, fainting, and even apoplectiform seizures of transient duration; and, on the other hand, if the spinal disturbance is more marked, there are found weakness of the legs, periodical pains, a very slight loss of power of the flexors of the arms, and occasionally a difference in the size of the pupils.

In the early stages of the disease the pulse is full and rapid, from 120 to 144, and during the occurrence of the cephalic phenomena the temperature will rise as high as 106°. After the activity of the febrile symptoms has subsided, the pulse usually becomes feeble and slow, from 70 to 80, and the temperature falls from a half to a degree and a half below the normal standard. The pulse and temperature are, however, subject to repeated fluctuation on the recurrence of fever, which often takes place without immediate perceptible cause.

The impairment of motion is at first so slight as scarcely to be perceived, as the patient can execute all the requisite movements without much hesitation, and it is only by very careful attention that the actual loss of muscular power can be correctly ascertained. The inability to maintain the erect posture and to sustain locomotion, even for a short time, without showing great fatigue, makes the alteration appreciable. The paralysis, which always begins in the lower extremities, may remain for a long period of time incomplete, without any perceptible progress; yet after a longer or shorter duration, it will eventuate in total akinesia of one or both legs.

The diminution of muscular activity does not observe any constant uniformity of progression. Generally one of the lower limbs is first and alone affected. It feels heavy and difficult to move, the toe droops, and the whole limb sometimes unexpectedly gives way. The other leg, sooner or later, passes through the same routine, and the patient finds it difficult to maintain the erect posture or walk without the aid of a cane. When

the lower limbs are very unequally affected, the gait, even in the early stage of the disease, is uncertain, embarrassed, and titubating. The legs are not, however, flung forward in the abrupt and continuous manner seen in locomotor ataxy, but are spread widely apart to enlarge the basis of support, owing to the muscular weakness and the uncertainty caused by the tremor which soon supervenes. Commonly the embarrassment increases very slowly, and the patient may, with the help of a cane, pursue his ordinary avocation, but, with the gradual loss of well-directed movement, the act of walking eventually becomes too laborious to be performed in any manner.

The total inability to walk or stand without support, may, however, not be owing alone to loss of muscular power, but can be caused by anæsthesia of the skin of the soles of the feet, by which the integrity of what is called the muscular sense, a necessary requisite both for maintaining the erect posture and for successful locomotion, is destroyed. When the normal sensibility of the plantar surface is impaired, as sometimes happens in antero-lateral sclerosis, the patient feels as if he was stepping on some soft material; his gait becomes awkward, hesitating, and stumbling; and he is apt to trip on the slightest elevation. The defective motion arising from impaired plantar sensibility, which by practice can be somewhat compensated for and partially remedied by the use of the sight, in daylight, may be so great as to wholly prevent the patient at night, or when blindfolded, from walking even a few steps, and thus imitate this feature of locomotor ataxy so much as to create doubt in the mind as to the exact seat of the lesion. When there is little or no plantar anæsthesia, the sufferer from antero-lateral sclerosis can, when blindfolded, walk a straight line without remarkable deviation.

When from defective muscular support motion can no longer be accomplished without the assistance of a crutch, or the arm of an attendant, the feet do not leave the floor, but glide along, as it were, one following the other, a notable characteristic of the second stage of paralysis. After the disease has continued many months the paresis gradually extends upwards, and the arms begin to fail in the same manner as the legs, or one of them gets very stiff, and ultimately becomes permanently flexed. The muscular debility of the arms can sometimes be well shown by directing the patient to put a spoon to his mouth, or take a tumbler of water. The fingers are first spread in order to more firmly grasp the spoon or glass, then the limb rises in defined and successive gradations till the mouth is reached and the article clatters violently against the teeth.

Though the tendency is strongly marked towards steady, progressive diminution of muscular power, there usually occur periods of inactivity when the paresis remains precisely of the same degree, or some perceptible improvement may even be manifested. The muscles of the

affected limbs respond to the stimulus of electricity, and their reflex action is still maintained to the very last stage of the disease.

Both the upper and lower extremities usually retain their natural appearance until excessive emaciation, as in all forms of chronic wasting disease, reduces them in size.

While in nearly all other cerebral and spinal diseases paralysis of the sphincters is commonly an initial symptom, it seldom or never occurs in the early stages of antero-lateral sclerosis. At the first there may be some slight impediment to urination, and more or less inactivity of the rectum, yet the sphincters exercise their control till near the termination of a case. Strange to say, the power of copulation, and the desire therefor, remain long after it might reasonably be supposed such instinctive feeling had altogether ceased.

The rhythmical muscular tremor that is often so prominent a phenomenon is not present at first, but gradually comes on. It may be merely a limited and rapid motion, or may be so violent as to closely resemble paralysis agitans, for which it has often been mistaken. The distinction between the two diseases is, however, sufficiently marked. The tremor of antero-lateral sclerosis begins with the inception of voluntary muscular exertion and ceases when the action has been accomplished, whilst in paralysis agitans, the movement is spontaneous and constant, and even continues when the person is at rest. Sclerosed patients, in whom the paresis is only partial, often feel, when in the recumbent posture, as if nothing whatever ailed them.

In uncomplicated antero-lateral sclerosis actual pain, arising from the disease, is seldom or never experienced by the patient. The unpleasant feeling, which occurs in the hands in holding anything, or in the act of shaking hands, and the numbness or formication in the lower limbs, cannot be regarded as pain.

Vertigo, which is a common symptom of several nervous diseases, such as epilepsy and Menière's disease, or disease of the labyrinth of the ear, is present, according to Charcot, in about three-fourths of the cases, and indicates the invasion of multilocular sclerosis. It is not ordinary vertigo, however, but of a gyratory kind like that produced by vinous intoxication. The uncertainty of gait arising from muscular defect, and the vertigo, induce the patient to keep his eyes fixed on some object, at short range, which he tries his best to walk up to, and thus keep a straight line.

The disturbance of the normal tactile sensibility of the skin over the whole surface of the body is one of the points upon which the authorities do not agree. Some contend there is little or no marked anæsthesia of the skin, while others believe it to be an unquestionable peculiarity. Rosenthal has pointed out this discrepancy of opinion, and has shown that the grade of anæsthesia is a sort of index, both to the form of the disease

and the direction in which the morbid action is progressing. When the disease is confined to the interior of the cord the anæsthesia is only slight, but if the gray portion of the anterior cornua is much invaded by degeneration, or if the disease encroaches on the confines of the posterior columns, the anæsthesia is much increased. Great variation may be discovered in different cases, both in the degree of anæsthesia of any portion of the body, and the extent of the surface which may be affected.

The descending sensory branches of the fifth pair of nerves have their origin in the anterior cornua near the floor of the fourth ventricle. From their anatomical situation, it could readily be anticipated that these nerve filaments would have their proper function impaired, and consequently the tactile perception of the parts to which they are distributed, equally injured, by any morbid change in the upper and anterior portion of the cord. Anæsthesia of the parts supplied by the sensory branches of the fifth nerve, though not found perhaps in every instance, is witnessed in such a large proportion of cases, and the exceptions thereto are so rare, that it may be justly esteemed a special and important symptom of antero-lateral sclerosis.

In a case of descending antero-lateral sclerosis now under my care, in a German labourer, forty years of age, of temperate habits, who contracted the disease by working in a cold, damp, and exposed situation, in which the morbid process appears as yet chiefly limited to the anterior cornua and upper portion of the spinal cord, this symptom is well exemplified. The sensibility of the skin of the whole trunk is not perceptibly reduced, whilst that of the skin of the sides of the face and ears is greatly diminished, and in the portion of the face outlined by the buccinator muscle the anæsthesia is so complete that the deep pricking of a sharp pin cannot be felt at all. From the uneasiness caused by this derangement of sensibility he is almost constantly, when seated, stroking his face with his hand, the thumb and fingers outspread, passing from above downwards as if to steady the muscles. Precisely the same action can often be seen in a diffident person, violently embarrassed, trying to subdue the facial evidence of embarrassment, or a man, who has just got drunk and pretends to be still sober, when striving to articulate more distinctly—so closely do the manifestations of an ephemeral emotion, and the transitory disturbance of a nervous centre, momentarily simulate the insignia of a profound and fatal lesion.

A considerable experience is required to avoid mistakes in estimating the exact degree of anæsthesia resulting from disease, because the capacity of recognizing normal local pressure sensation greatly varies in different portions of the human body, and in the same parts in different individuals.

If a healthy man sits with one leg crossed upon the other, and the ligamentum patellæ be then smartly struck with a dull-edged instrument just

below the knee-cap, there occurs a sudden contraction of the extensor muscles in front of the thigh, and the foot involuntarily flies upward. In 1875, from the observation of a number of cases of locomotor ataxy, Dr. Westphal showed that this knee- or leg-phenomenon, as he was pleased to call it, was absent in typical cases of the disease, and he believed he had discovered thereby a means of distinguishing this from other forms of paralysis.

The subsequent experiments of several distinguished neurologists seemed for a time to fully confirm this opinion, but the report of several cases, where the absence of the patellar tendon reflex was noted in other forms of disease, has impaired its importance as a diagnostic symptom. The application of such a test to be valuable must yield the same results without exception. In the case above cited, in which there was neither impairment of vision, inequality of the pupils, loss of muscular sense, nor pain of any kind, when either leg was crossed and the ligamentum patellæ was sharply struck with a heavy wooden ruler, the leg gave no more response to the blow than that of a cadaver.

It has been asserted that the normal speed of transmission of sensation is retarded in the various forms of spinal sclerosis, and that thereby the physiological time, as it is technically called, is greatly lengthened. Physiological time is a very convenient term, borrowed from astronomy and introduced into physiology by Wm. Wundt¹ of Heidelberg, to denote the whole time occupied in the reception and cognizance of visual, auditory, and tactile impulses. It would be impossible to prove this assertion without the aid of electricity and the use of Hipp's chronoscope or some other apparatus suited to divide a minute into thousandth parts, and the proof could only be obtained after hundreds of experiments to eliminate the many sources of error which surround the question. From repeated and careful observation, it is generally believed that the impulse of light, sound, and tactile pressure traverse the nerve with normal expedition, though much diminished in intensity, as long as the nerve is not wholly destroyed.

In antero-lateral sclerosis the eye is sometimes slightly affected from the beginning, but in general the sight remains undisturbed throughout the course of the disease. During the progress of a case however, first one eye, then the other, may display characteristic alterations, beginning with contraction of the field of vision; central vision will begin to fail; the normal perception of colour may be interfered with, and, if the process be continued, it will terminate in the disappearance of the macula lutea and the appearance of a few pearl-like points in its stead.

Nystagmus or rolling movement of the eyeball is a symptom of importance, and is witnessed, according to Chareot,² in about one-half the number

¹ Grundzüge der Physiologischen Psychologie, Leipzig, 1874, S. 728.

² Maladies du Système nerveux, tome 1er, troisième édition, p. 234, 1877.

of cases. The oscillation may be horizontal, rotary, or vertical, and may vary in degree from slight obliquity to complete distortion. In a case I have frequently seen of the vertical form, the oscillation is so pronounced that the corneæ of both eyes are only visible for a short time, at long intervals, and the patient is thereby totally deprived of the use of his eyes.

The tongue is not known to be affected either by loss of motion or diminution of size, but there is sometimes a loss of the power of taste. There is a peculiar characteristic of the speech which is slow, labored, and drawling. The power of speech may be said to be good, the answers are correctly given, without perversion of the words, but the delay of reply to an interrogatory is so great at times as to excite a doubt whether the question has been properly heard or understood. The enunciation, with the exception of the consonants *l*, *p*, *v*, though very slow and scanning, is sufficiently distinct, with nothing like the difficulty which obtains in cases of bulbar paralysis.

There may be defective hearing in one or both ears, or total deafness in one ear, yet this is rather exceptional.

So long as the convolutions of the brain remain free from multilocal sclerosed spots, and the disease confines itself to the tissues of the cord, although movement of any kind can only be most laboriously made, the intellect remains unclouded, and the psychological functions are well performed. This remarkable feature is common to both labio-glosso-laryngeal paralysis and sclerosis of the anterior columns of the spinal cord. There are no hallucinations or perversions of the senses, and no fixed delusions, such as belong to the general paralysis of the insane. The patient is not despondent, but is often cheerful, at times he is rather emotional, and is apt to cry or laugh when spoken to abruptly, but is more disposed to smile or laugh heartily, sometimes without sufficient or any cause, than to cry. With the progressive debility accompanying the disease this emotional exaltation gives place to a slight melancholy and hebetude of the mind, with failure of the memory.

The mental condition recognized in antero-lateral sclerosis gives rise to a very practical medico-legal question, owing to the fact that the popular mind cannot be divested of the belief that all forms of paralysis are caused by softening of the brain, and consequently that every paralytic is unfit to execute a legal instrument. This was well shown in a case tried at a small town, in this State, in which I was consulted by the counsel for the defence, where a man 45 years of age, who had been a long time paralyzed, had made a will in favour of a woman who should have been, but unfortunately was not, his wife. After his death the collateral heirs, supported by common opinion, determined, on the ground of mental incapacity, to break the will, and brought suit for that purpose. At the trial the defence proved the testator's capacity to transact business and to clearly distinguish right from wrong at the time of executing the will, and, by the

citation of medical authorities, succeeded in convincing the court that a man, though totally unable to walk, and with extraordinary slowness of speech, was not necessarily unsound in mind. After a few minutes' deliberation the jury decided in favour of the devisee.

Throughout the existence of the disease there are remissions which occur without regular periodicity and are more or less pronounced. They are sometimes so decided as to beguile the practitioner into the belief that actual benefit has been derived from his well-devised plan of treatment. During these periods, the paresis, the anæsthesia, and vertigo may even show visible signs of improvement.

Duration.—No exact limit can be definitely named for the duration of antero-lateral sclerosis; it may run its course and destroy life in a few months, or it may last for even ten or more years, the estimated average being from five to six years. Its rate of march is so unequal, and has in some instances so many prolonged periods of repose that it is impossible to foretell the length of time a case will probably last.

After the above detailed enumeration of the symptoms but little will be required to be said on the subject of diagnosis. A short recapitulation of the more prominent symptoms, especially those found in the inception of the malady, when it can be more easily confounded with other diseases of somewhat allied character, will perhaps prove of advantage.

The slight and transient disturbance of the vision and the mental faculties; the integrity of the reflex and electric response of the muscles; the drawling slowness, but distinctness of speech; the slightly altered sensibility of the skin, with the exception of that of the face; the capacity to walk without hesitation when blindfolded whilst at the same time the patient betrays excessive fatigue from the most trifling muscular exertion, and complains of coldness and numbness of one or both legs, are the indications of antero-lateral sclerosis in the first stage of the disorder.

These phenomena become more prominent and decided as the disease progresses; the patient can perhaps stand alone, but can no longer make more than a few steps without the support of a cane; the foot still rises in walking and the toe is elevated; the power of the flexors of the arms gradually fails; the rhythmic movement of the muscles begins to manifest itself on voluntary muscular exertion; the anæsthesia of the face is more decided; and the decrease of motor innervation is unmistakable. These symptoms constitute the second stage.

In the last stage the patient can no longer stand, he is compelled to lie down; and yet the lower limbs may still be capable of limited movement when in this posture. One arm may begin to contract, and by degrees grow permanently flexed, while the other remains capable of motion. Obstinate constipation of the bowels, derangement of the digestion, difficult micturition, and the incapacity to change his position, greatly increase the discomfort of the patient. When to these are added cephalic disturb-

ance, accompanied by epileptiform seizures and mental perturbation, it may be inferred that the morbid action is no longer limited to its original site, and the deposit has become disseminated through the brain as well as the spinal cord.

Diagnosis.—The diseases with which antero-lateral sclerosis may be most easily confounded are, paralysis agitans, softening of the brain, tumour of the brain, locomotor ataxy, and the trembling muscular movement found in persons suffering from a hard, firm, long-continued stricture of the urethra. Although the tremor and rhythmic movement are increased in paralysis agitans by emotional excitement or muscular exertion, and may also be exaggerated by the same causes in antero-lateral sclerosis, they do not subside in the former when the effort of motion has ceased, as they do almost immediately in the latter when the patient is again at rest. In the first the tremulous movement is constant, while in the second the tremor is only manifested during voluntary muscular action.

Ramolissement, or softening of the brain, is accompanied by rapid mental impairment, with paralytic or aphasic deterioration of the speech, and by paralysis of a more decided nature, and occurs mostly in persons of advanced life. The apoplectiform seizures in softening of the brain are more violent in form, and leave behind a permanent deficiency of muscular power unlike the transient seizures of antero-lateral sclerosis, which seem to interrupt the insidious progress of the malady, without apparently much increasing its severity.

Tumours of the brain are distinguished from sclerosis of the cord by the repeated and violent periodic pains in the head, violent, sudden, and unexpected attacks of vomiting at intervals of short or long duration, intense and lasting vertigo, irritation of the nerves of the face, convulsions, loss of sight, and sometimes hemiplegia.

In the formative stage of both diseases, when doubt is more probable, progressive locomotor ataxy, or sclerosis of the posterior columns, can be differentiated from antero-lateral sclerosis by the severe fulgorant pains along the course of the nerves of the trunk and the lower extremities; by the loss of muscular co-ordination; by the violent, involuntary, spasmodic contraction of the muscles when the patient is in repose; and by the inability to keep the erect posture, or walk without the aid of the eyesight.

The trembling of the upper and lower limbs, and the inability to walk without excessive fatigue, that are produced by an old and indurated stricture of the urethra, generally occur in men the subjects of rheumatic gout, and slightly imitate the tremor and muscular debility seen in antero-lateral sclerosis. The examination of the urethra, and the dilatation of the stricture, followed by the rapid improvement of the gait, will plainly demonstrate the difference. It will readily be admitted that the victim of sclerosis may have been afflicted with a firm stricture for a long period,

but should such be the case, the speedy change will not take place after it has been freely dilated.

The *prognosis* is always unfavourable in antero-lateral sclerosis. Its movement is only in one direction, which though nearly always slow, and subject to interruptions of short and long duration, has invariably a fatal termination. No cure has ever yet been recorded, where the diagnosis has remained unchallenged, and no such happy anticipation seems at present to be entertained. It is possible, however, as the disease comes to be more familiar to the profession, some method of treatment may be discovered, which might succeed in staying its progress in its formative stage.

Treatment.—A great number both of external and internal remedies have been employed and assiduously persevered in for a long time, but unfortunately without happy results. Many of the most celebrated mineral springs have been resorted to, and the strict regimen enjoined has been rigorously adhered to by patients anxious and willing to try any method which promised relief, but uniformly without success. The list of drugs which have been faithfully tried is already very extensive; the mercurials, the various preparations of arsenic, phosphide of zinc, chloride of gold, nitrate of silver, phosphorus, strychnia, belladonna, ergot of rye, iodide of phosphethylamine, bromide of potash, iodides of ammonia, soda and potash, and a great many other remedies; all with the same unfortunate result. There is frequently a decided intolerance of the last-named remedy in this disease. I have seen it, however, in large doses, where the morbid process has a disposition to spread to the dura mater, to become diffused, which is recognized by the accession of severe nocturnal pains, add greatly to the comfort of the patient.

No benefit whatever has followed the use of electricity or faradisation, or any external applications such as chloroform, irritating liniments, blisters, moxas, and the actual and potential cautery.

Pathology.—The meninges are not always involved, but frequently they are found adherent, and the pia mater is sometimes thickened, and its vessels, which are seen turgid with blood and much enlarged, stand out stiffly like a strong network of heavy threads, interlacing one another in all directions.

The macroscopic anatomy of the seat of morbid deposit presents a uniformity of appearance, and a clear definition of outline, which make it strongly contrast with the surrounding healthy structure. When of long existence, whether diffuse or circumscribed, the spots of deposit, quite variable in size and number, but somewhat regular in outline, of a fawn-tinted gray colour, differing from that of the adjacent portions of the cord, can be easily recognized by the unaided eye. When these spots are divided, a thin transparent fluid exudes from them, and if they are exposed to the air for a time they assume a rosy tint. The diseased points

are usually of a homogeneous colour, but if they are very old it is no longer uniform, and on section they will be found to contain light striæ, quite friable, which are the remains of the nerves, surrounded by the abnormal gray tissue.

At times, especially in disseminated sclerosis, the diseased tissue assumes larger proportions, and is found in nodules variable in size. Of this form is the case presented in the beautiful plate—the first illustration of spinal sclerosis—published by Cruveilhier¹ in his masterpiece of pathology, which may be compared to Rabelais in the literature of comedy, as the fountain whence so many subsequent authors have drawn their inspiration. With this iconographic evidence in full view, it appears extraordinary how such a plainly visible and important lesion could have remained so long unnoticed.

In the drawing of the case described by Dr. H. Liouville, in the last edition of Charcot on “Nervous Diseases,” the sclerosed nodules on the base of the brain, that on the optic commissure, and those on the pons Varolii, are very conspicuous; while along the anterior portion of the spinal cord, the islets or spots, covered by the highly vascular pia mater, are easily seen.

In the drawing (see Plate), the nodules behind the optic commissure, and close to it, and on both sides of the anterior portion of the medulla oblongata, are extraordinarily large and unmistakable. This is an accurate delineation of the condition of the base of the brain and the upper portion of the spinal cord found in an autopsy made March 3, 1879, of a case of disseminated sclerosis, in a gentleman 52 years of age, that occurred in the practice of Dr. T. W. Shaw, which I had the honour to attend in consultation. The nodule on the right side of the cord is as large as the end of the finger, but more pointed, and embraces within its grasp nearly the whole of the pneumogastric nerve. Different portions of the brain, the ventricles, and the corpora striata, were dotted with sclerosed spots of small size, many of which were plainly visible to the naked eye. The lower portion of the spinal cord, as far as it could be examined, showed no trace of disease except a slight injection of the pia mater.

CASE.—For more than fifteen years, this gentleman had suffered, with scarcely any remission, with a severe pain in the back without experiencing relief from any of the various remedies which had been employed. For over ten years he had been subject to attacks of urticaria, having no periodicity, of variable duration, sometimes continuing utterly unyielding for months, in spite of all treatment, and at others vanishing completely in a few days. During the continuance of the eruption, his general health was always better than ordinary, and he was entirely free from the obstinate pain over the spine. For the past seven years his health had slowly declined, and

¹ Anatomie pathologique du Corps humain, par J. Cruveilhier, Paris, 1832 Planche II., livraisons. xxxii.

the muscular debility was so great at times that locomotion could scarcely be performed at all.

The symptoms present in this case on the 30th of last November, or three months previous to death, were the following: pulse 84, irregular and feeble; temperature one degree below normal; bowels sluggish and costive; the imperfect evacuation of the bladder required the frequent use of the catheter; great derangement of the stomach, with flatulent indigestion and severe attacks of vomiting; sudden and violent paroxysms of dyspnœa, when the heart's action became extremely feeble and very irregular; excessive pains in the head, neck, and left side of the chest, especially at night. There was no defect of vision; the field was normal both as to size and the recognition of colours, the pupils were, however, permanently dilated, and a curious optical disturbance occurred at times, as of a small body, the size of a pea, falling from above downwards; the intellect in every particular was unimpaired; there was no difficulty in walking across the room with the eyes blindfolded, nor in keeping the erect posture for a short time, but when standing, if the patient attempted to look down at any object on the floor, even for an instant, he would suddenly fall down. Owing to this he could not venture to stoop down to bathe his face, and he was compelled to keep the head perfectly erect during his toilet. There was considerable anæsthesia of the whole face and neck, and very decided loss of sensibility of the outer portion of the legs and thighs, the patient being unable to recognize tactile pressure of less than two inches, while on the remainder of the body the skin was normal. Except a reduction in the size of the vessels, ophthalmoscopic examination of the interior of both eyes showed nothing abnormal. The respiration was perfectly natural over the whole of the chest, and the sounds of the heart, except during the paroxysms of violent dyspnœa, were normal.

With the exception of the slight benefit to the digestion from the administration of ordinary correctives, and the temporary relief of the severe pain in the head and neck afforded by the use of anodynes, no perceptible amelioration of these distressing symptoms was obtained from any remedy employed. Neither was the steady march of the disease checked, in the slightest degree, from any method of treatment which could be devised. On the 10th of February, the patient became bed-ridden with the great aggravation of his sufferings, but with his mind calm and clear, and succumbed to the disease on the 2d of March.

The diagnosis in this case, long before death, was neither doubtful nor obscure. The history of the case and a careful analysis of the group of symptoms showed that in all probability there was extensive sclerosis of the brain adjacent to, but not invading the optic commissure, and of the upper portion of the spinal cord, involving the pneumogastric nerves, which the autopsy fully confirmed.

It is quite rare that such large sclerosed deposits are found as are shown in these three instances, and resort must frequently be made to the microscope to discover the points of the brain and spinal cord affected with sclerosis.

The chief histological elements of the spinal cord concerned in sclerosis are: the capillary vessels, the nerve tubules with their sheaths, described by Schwann, the nerve cells, the reticulum so-called by its discoverer

Kölliker, and since more thoroughly described by Virchow, who designated it the neuroglia, or nerve-glue—the name now universally employed—and the trabeculæ or the proper connective tissue of the cord.

Much difference of opinion exists as to the position of priority of these different elementary portions in the process of gray degeneration or sclerosis, and the method of its evolution and its spread from the original seat to the surrounding tissue.

It is generally conceded that the first departure from normal condition takes place in the minute capillaries, whose coats become thickened and hardened, but without perceptible increase in their calibre. The next alteration in the transformation is believed to be owing to a hyperplasia of the neuroglia, followed by atrophy of the nerve tubules by the pressure thus produced.

When the cord is carefully examined by transverse section, the gray discoloration of the surface is found to be due to a change in the white matter, which extends into the cord from the periphery. The chief textural change is an increase of the interfibrillar connective substance of the medullary columns. Under the pressure of this stuffing or deposit which takes place in the trabecula of the neuroglia, the nerve tubes, in a sclerosed patch, are sometimes found to have wholly disappeared, while others are merely deprived of their sheaths, leaving their axis cylinders much enlarged in size. In a single specimen of moderate size, the various stages of progress of this phenomenon may sometimes be witnessed.

It is very difficult to decide whether the nerve tubes with their cells or the neuroglia is the primary seat of the invasion of gray degeneration.

“For my own part,” says Rindfleisch, “I cannot well conceive of the degeneration of the nerve fibres as the primary phenomenon; atrophic changes of nerve tubes artificially excited in peripheric nerves, never give rise to any analogous effects in the perineurium. On the other hand, I can call to mind innumerable examples of atrophy of nerve fibres being caused by external pressure. I quite agree with Frommann, in believing that the growing network of connective tissue forces its way into the place assigned to the nerve tubes and thus ultimately causes their disintegration.”

The increase of the size of the minute bloodvessels, the gradual formation and the deposit of bone from the callus thrown out in a fracture of a long bone, furnish an exact but somewhat coarse representation of the process in which molecule after molecule of the material of sclerosis is deposited in the diseased spinal cord.

A microscopic section of a fresh specimen of a sclerosed nodule presents a great number of large cells, like fatty globules in appearance, which in some portions are found in small groups and in others aggregated in large masses. They differ from ordinary fat globules in the irregularity of their outline; many are ovoidal, others club-shaped, and a small number resemble the figure of a kidney.

Much skill and patience have been expended by Deiters, Frommann,

and other histologists in devising indisputable methods of making preparations of the brain and the spinal cord, wherewith to demonstrate the distinctive microscopic appearances of the neuroglia, the nerve tubules and nerve cells. After the hardening produced by digestion in a solution of chromic acid, these tissues have been found to possess the susceptibility to coloration by the application of carmine in dilute solution of ammonia, after maceration for the space of twenty-four hours. The nerve cells, both nuclei and nucleoli, thereby acquire a strong carmine colour, and the neuroglia a pinkish or lighter shade, while the axis cylinder is the only part of the nerve tubes which receives the carmine tint. It has been repeatedly demonstrated that sclerosed points or patches, wherever found, and of whatever variety they may consist, cannot be made to stain in this manner, and thus a ready and efficient means has been discovered, not only of identifying this morbid product, but of estimating in any specimen the relative proportion of true nerve tissue and neuroglia which may be involved. The effect of this process is beautifully shown in a coloured plate given by Mr. Kesteven in the *British and Foreign Medico-Chirurgical Review*.

It has often been strenuously asserted by gentlemen of authoritative standing in the profession, who are far above the suspicion of the simple vanity of a desire to hold an opinion opposed to general belief, that no visible anatomical change of structure in the brain and spinal cord can ever be discovered after death that would fully and satisfactorily account for the symptoms which had existed during life, and that the evidence adduced was due to post-mortem alterations or effects resulting from the action upon the tissues of the various reagents employed to prepare the specimens for examination. It appears impossible to reconcile this direct contradiction with the light shed upon the subject by the mass of testimony which has lately been accumulated. Nothing but the admission of a possible visual defect can account in a satisfactory manner for such a wide difference of opinion. How very few of the inhabitants of a large city who are familiar with the appearance of diamonds can tell the real gem from the paste imitation, yet it would be absurd to say that because only experts can, without failure, distinguish one from the other, no genuine diamonds exist.

The coloration of tissues would at first sight appear to be only a negative means of demonstrating the existence of sclerosis, but by this method the foreign matter is so completely isolated that it will be found after a little experience to be a convenient mode of qualitative analysis. When proper care in manipulation has been observed, a decided and regular uniformity of result is obtained in the process of staining the tissues for the detection of sclerosis of the brain and spinal cord. In a collection of finely mounted specimens of the different varieties of spinal sclerosis, kindly sent to me by Dr. Scriba of the University of Heidelberg, and in the slides containing sections of the spinal cord procured from the autopsy above men-

tioned, prepared by hardening in chromic acid and stained by solution of carmine, the similarity of the microscopic appearances of the morbid tissues from those widely separated sources is at once recognized. If these be compared with the exquisite engravings in the able monograph by Frommann,¹ their identity is easily established. Moreover, as has already been stated, in many well-authenticated cases of sclerosis the points or patches, in recent specimens, are not only visible to the naked eye, but can quickly be recognized by the finger in the contrast of density and hardness they bear to the surrounding tissue.

The exacerbations, which are accompanied by febrile excitement and severe cephalic symptoms, and perform so important a part in the natural history of spinal sclerosis, well deserve attentive consideration. In established malignant disease, characterized by the interstitial deposit of heterogeneous material which disorganizes the tissues, such as tuberculosis and carcinoma, external and internal, the morbid process does not always pursue a steady and uniform rate of destructive action, but is at times quiescent for a considerable period, and at others, when a tract of hitherto healthy structure is attacked, it acquires an impetuous and violent activity. The invasion is attended by constitutional disturbance, such as fever, elevation of temperature and other phenomena, and by local symptoms, such as redness, heat, erysipelatous inflammation, and congestion, which extend their area far beyond the site to be ultimately occupied by the fresh addition of malignant deposit. As this deposit becomes limited to its destined space, the active general and local symptoms concurrently subside, and a remission more or less decided ensues, to be followed sooner or later by a repetition of the whole programme. The same concatenation takes place as soon as a previously unassailed portion of the spinal cord has been permeated for the development of a patch of sclerosis. Owing to the direct continuity of the membranous connections of the brain and spinal cord, either through the medium of the dura mater, the arachnoid, or both at the same time, the spread of inflammation may be rapid and extensive in the cerebro-spinal organs. When of great extent, the nerve centres become more or less involved, and the objective phenomena arising therefrom will be found to vary in the degree corresponding to the severity with which the organic, sensory, or motor ganglia may be affected.

Although the connection of the cavities of the spinal cord and the ventricles of the brain was known to Galen, Vesalius, Cotugno, Willis, and many other anatomists, the intimacy of this relation was unknown till quite recently. The space between the internal surface of the dura mater and the external layer of the arachnoid—the arachnoid space of early authors—has been demonstrated by Axel Key, and Gustaf Retzius to be

¹ Untersuchungen über die Gewebsveränderungen bei der Multiplen Sklerose des Gehirns und Rückenmarks, von Dr. C. Frommann, Jena, 1878.

continuous over the whole cerebral and spinal cord surfaces. This, which they term the *subduralraum*, or subdural space, has communications with the serous cavities of the higher sense organs. In man there is no direct communication between it and the subarachnoid cavity. When the subdural space is injected in the fullest manner, none of the fluid injection passes from it into the arachnoid cavity. The subdural space is connected with the brain by means of the bloodvessels, the general lymphatic system, and more importantly by the serous tracts of the peripheral nerves. It is not a closed sac, however, but is continuous with the interior of the peripheral nerve sheaths to their most distant ramifications.

These celebrated anatomists describe a space of large extent between the arachnoid fold attached to the dura mater and that attached to the pia mater and surface of the brain and cord, which they call the subarachnoid space. By the use of fine injections of a solution of gelatine coloured with Prussian blue into this subarachnoid space, new and unsuspected direct communications were discovered between the spinal cord and the cavities of the brain. In this superb work¹ of Key and Retzius are beautifully displayed the immediate connections existing between the subarachnoid space and the ventricles of the brain. These life-size drawings of the sagittal and parietal sections of the skull, with the injected brain and medulla oblongata, were made from bodies which were carefully injected and afterwards frozen in a horizontal posture, in order to secure facility in labour and an approximation to absolute precision in research.

The field occupied by the fatal disintegration called sclerosis is the most highly organized portion of the whole body—the nervous system—the source of all physiological stimulus and the seat of vital energy. For the accomplishment of their exalted functions, its organs require a greater delicacy of structure and a nicer adjustment of molecular movement than belong to any other part of the economy. Without reflection it would seem mysterious that these remote nervous centres, protected as they are from ordinary injury in their fortified home, should be selected as the scene of destruction, but when the abuse in every form which is constantly heaped upon them is fully estimated, the wonder is not that they are chosen for the development of disease, but that they should so often escape the effects of such continued violence.

¹ Studien in der Anatomie des Nerven Systems und des Bindegewebes von Axel Key und Gustaf Retzius. Erste Hälfte, Taf. vii., Stockholm, 1875.

ARTICLE II.

CÆSAREAN SECTION WITH REMOVAL OF UTERUS AND OVARIES AFTER THE PORRO-MÜLLER METHOD. By ELLIOTT RICHARDSON, M.D., Lecturer on Practical Obstetrics, University of Pennsylvania, etc., Philadelphia.

THE woman whose case forms the subject of this article is a dwarf, 25 years of age. She measures 46 inches in height, and weighed, immediately before the beginning of gestation, 85 pounds. She is not well-formed, her head and body being disproportionately large; still, though the head and face would become a woman of ordinary size, the body is short and narrow. More particularly is this noticeable about the hips, from which the thighs spread outward in so remarkable a manner that it was difficult, when the woman was lying in an extended position, to feel the crests and anterior superior spinous processes of the ilia. This prominence of the thighs was largely due to the amount of muscular and adipose tissue present, but probably, also, in part to the existence of some curvature of the femur, though, owing to the great development of the soft parts, this could not be definitely determined.

The most careful measurements of the pelvis gave:—

External	{ Between anterior superior spinous processes	22½ e. m. (8.86 inches)
	{ Between crests of the ilia	24 " (9.45 ")
	{ External conjugate—superior strait	16 " (6.3 ")
	{ Between trochanters	29½ " (11.6 ")
Internal	{ Conjugate at superior strait	4¾ e. m. (1.87 inch)
	{ Transverse at superior strait less than	10 " (3.93 ")

Like most dwarfs, her wrinkled face made her look much older than she was, though everything indicated good health. Her appetite and spirits were good, and the functions of all her organs seemed to be normally performed.

Careful inquiry of herself and of a friend, who had known her from infancy, elicited the fact that she had never suffered serious illness nor protracted indisposition of any kind. Indeed, I am informed that she has always enjoyed unusually good health.

Her deformity I believe to have been inherited from her father, of whom, I have been told, she is a perfect image. She was born in Vermont, her father being also a native of that State, and her mother, a woman of ordinary size, a native of Ireland. Her uncles and aunts on the father's side are all of at least the medium height, and one of her father's brothers measured over six feet.

She first came to me about the middle of August, 1880, with the object of learning the nature of a steadily increasing abdominal swelling. Examination revealed, without difficulty, a living fœtus within the uterus. The history of her pregnancy is, in brief, as follows: Her last menstruation ceased December 31st, 1879; on January 7th following, she was married, then ensued the usual signs of pregnancy. I fixed upon October 6th as the probable time for labour to begin, and, upon informing her of the dangerous nature of such labour to herself and child, she readily consented to undergo any operation I might see fit to advise. I decided to recommend Cæsarean section as modified by Porro, and obtained her consent thereto.

It was thought best to select a time for the operation about two weeks anterior to the supposed period for labour to begin, on account of the many

advantages to both the patient and operator of ample preparation, of both the option of the day and of the time of day, and of the absence of the exhaustion incident to labour. But further, it was thought that the presence of a well-defined cervix would greatly facilitate the application of the retaining ligature at the time of operation, and thus favour its success, a suggestion for which I am indebted to Dr. Ruel Stewart of this city.

Accordingly I commenced to prepare for the operation. In this preparation I adopted measures somewhat at variance with those usually recommended in operations of so serious a character. It is the common custom I believe to give, for a few days or weeks before operating, some kind of tonic or stimulant, but, as she was in health, I simply advised good food, fresh air, and exercise. It is also, I believe, the almost uniform custom, when preparing a patient for an operation involving subsequent rest of the bowels, to give, a few hours before the time for operating, a thorough cathartic. When this has been done, in the cases where I have had an opportunity of observing the after-treatment, I have repeatedly noticed a disturbed condition of the bowels, lasting for twelve or more hours after the operation, which, if checked by the use of opium, often results in more or less meteorism. It has appeared to me that in any operation involving abdominal section and the opening of the peritoneal cavity, that quietness of the muscular coats of the intestines is of the utmost importance, in order that all predisposing causes of peritonitis may be avoided. When, therefore, we have a short time before the operation, by the use of a cathartic, produced increased peristaltic movement, we induce a condition favourable to the production of peritonitis, not only by the movement caused in these structures, but by the determination of blood to them,—an afflux of blood which necessarily occurs to a greater or less extent upon increased movement of any part.

For the reason given I therefore omitted the conventional preliminary purge, and was satisfied to secure daily natural evacuation of the bowels, adopted a carefully regulated diet, and ordered an enema of castile soap and water two or three hours before the operation. Thus the preliminary treatment consisted simply in securing a healthy action of every function of the body as nearly as could be, and not in medication.

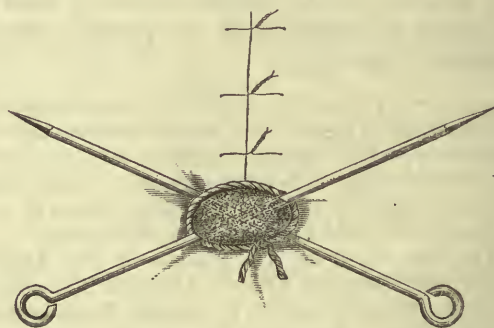
On the 22d of Sept. 1880, in the presence of Drs. Albert H. Smith, Goodell, Tyson, Ruel Stewart, Harris, Anna E. Broomall, Henry, and Bell, I began the operation by making an incision in the median line of the abdomen, extending from a point about $1\frac{1}{2}$ inch above the symphysis pubis to a point about 4 inches above the umbilicus. The incision was about 10 inches in length, and was made so exactly in the median line of the abdomen that certainly not more than a teaspoonful of blood was lost from this part of the operation, and that was chiefly from the portion of the wound which passed around the umbilicus. The bleeding was so slight that no hæmostatic of any kind was used, and no ligature applied. Having opened the abdominal cavity, the uterus was seen uncovered lying immediately beneath; this was then drawn out of the abdominal cavity, the walls of which were promptly closed behind it, and a piece of carbolized

flannel wrapped around its base to act as an additional protector to the abdominal wound and cavity and to absorb the fluids sure to flow from the uterus when incised. The wire loop of an *écraseur* was then rapidly passed round the uterus, secured and tightened. As the tightening process was going on the wire loop slipped gradually down to the cervix, and finally rested at a point a little below the *os internum*. By careful application only sufficient force was used to constrict the vessels and cut off circulation, but not enough to do permanent damage to the tissues. The uterus was then rapidly opened, and the placenta found placed upon the anterior wall, so that the line of incision passed directly through its centre.

This was somewhat of a surprise as the uterine *bruit* had been much more distinctly heard on the left side than on the right. The placenta was rapidly and completely detached and it and the entire ovum turned around within the uterine cavity, the membranes ruptured and the child extracted, followed by the entire removal of the after-birth. During the whole time this was being done, and, in fact, until the organ was detached from the cervix, no contraction of the uterus occurred, being prevented, no doubt, by paralysis caused by the retaining wire of the *écraseur*.

The next step in the operation consisted in the introduction of two stout, steel pins—about five inches in length and of the size of a No. 8 bougie, French scale, through the cervix. Of these, one was passed below and the other above the wire and diagonally to the line of the abdominal wound (see Fig. 1). A piece of stout silk cord previously soaked in carbolized oil (1 part to 11 parts) was tied tightly around the cervix between the two pins exactly in the line of the temporary wire loop, which latter was removed as soon as the permanent ligature was applied but before it was finally fastened. The silk ligature was wrapped twice around the cervix and then tied.

Fig. 1.



The uterus and ovaries were now cut off with scissors at a point about three-quarters of an inch above the ligature and the stump placed at the lower angle of the abdominal wound. Their appearance after removal is shown in the accompanying drawing (Fig. 2). Careful sponging of the cul-de-sac of Douglas, with carbolized sponges removed a very small quantity of bloody serum, after which I proceeded to close the abdominal wound.

This was done by interrupted silver sutures of which twelve were inserted—four of them superficial and the remainder deep, inclosing about half an inch of the peritonéum on each side. During the introduction of

the deep stitches a flat sponge was placed in the abdominal cavity beneath the flaps to catch and absorb any drop of blood which might escape from the wounds made by the needle. In this I followed the method used by Keith in his ovariectomy operations. After all the deep sutures had been applied, the sponge was removed. The wound was then closed and the stitches supported by long strips of adhesive plaster. Pure liquid carbolic acid was applied carefully to every part of the stump outside of the ligature, plates of lead placed under the pins to protect the integuments from undue pressure, and carbolized gauze, prepared after the method of Lister, applied to the whole extent of the wound and the exposed stump.

Fig. 2.



This was completely covered with carbolized Mackintosh and the whole kept in place by a flannel binder. No drainage tube was introduced. The patient was immediately placed in bed, and a hypodermic injection of a quarter of a grain of the sulphate of morphia administered.

The time occupied by the operation from the first incision to the closing of the wound was forty-five minutes, twenty minutes more were consumed in placing the superficial stitches and applying the dressings, and ten minutes in anæsthetizing the patient, making the whole duration one hour and a quarter. The time usually required for the Müller operation (which this was) is from one and a half to two hours, though, that for the unmodified Porro operation is less than an hour.

Porro's method is to operate precisely as in Cæsarean section, by a short abdominal incision, then to withdraw the emptied uterus and cut off it and the ovaries after ligating the pedicle, which is then fastened in the lower angle of the wound. In 1877, Georg Rein of St. Petersburg, now of Strasbourg, proposed to pass a ligature of wire or other material around the cervix *in situ*, but this has not been done I believe by any one. Prof. Müller of Berne, however, has operated as I did in this case, and was the first to do so. His first case was successful, and out of eight cases operated on by his method four have been saved, a favourable record for this opera-

tion as compared with the unmodified Porro operation. Two other cases operated upon in this way, but in which the pedicle was dropped into the abdominal cavity, died. This I believe has been the fate of all in which the pedicle has not been secured to the abdominal wound. The advantage of opening the uterus *in situ* is that the abdominal incision need not be nearly so extensive as that required to enable the operator to remove the uterus with its contained foetus and liquor amnii. If we believe that the statistics of Spencer Wells are of general application this would be of great importance as affecting the chances of peritonitis resulting from the wound.

In my case the operation was in every respect satisfactory as to its various steps and the absence of any signs of traumatic peritonitis prove that in this case at least the extensive incision was of no disadvantage. On the other hand, by the method adopted all the operating, save the incision through the abdominal walls (which with care may be almost bloodless), is done outside of the abdomen. The deluge of blood from the uterine sinuses and of liquor amnii occurs outside the body of the patient and not a drop of either fluid need enter the peritoneal cavity, at the same time the application of compression to the cervix and uterine bloodvessels is greatly facilitated; in fact, this is rendered so easy that, as demonstrated at the time by Dr. Stewart, the hand alone can accomplish this object without the use of any instrument. Lister's antiseptic method was fully carried out, but care was taken not to direct the carbolized spray upon the peritoneum.

A peculiarity of this operation is the large number of assistants required, owing to the fact that so many things have to be done at the same time and without the least delay. No one should undertake a Müller operation under the Lister antiseptic method without having eight assistants. The operator himself stands on the right side of the patient; directly opposite on the patient's left side, stands the first and chief assistant, whose duties are to follow the incisions with a sponge, to apply serrefines, or forceps, or the ligature to any bleeding surface. His services are also needed to steady the uterus after its withdrawal from the abdomen and while it is being opened by the operator, likewise to take and hand instruments. The second assistant stands on the same side of the patient as the operator and to his right. His duties are to apply the écraseur and to receive the child, which, after the cord is tied and cut by the third assistant, is handed to him for resuscitation. The fourth and fifth assistants are needed to promptly close the abdominal wound behind the uterus, keep back the intestines, and place the carbolized flannel cloth about the cervix. A sixth is needed to take care of the instruments and hand them to the first assistant, for after the application of the temporary constrictor there must be no delay in finding what is wanted in the pan of carbolized solution in which the instruments are placed. A seventh gives the anæ-

thetic and watches the condition of the patient, while the eighth has charge of the spray apparatus. If fewer are present, the operator is sure to be placed at a disadvantage and the safety of the mother and child compromised.

The history of the case after operation was in the main most satisfactory. For the first ten days the symptoms were remarkably favourable. Five hours after operation the temperature was 99.4° , pulse 64, respirations 16. On the following day from 5 to 8 o'clock P. M., the temperature reached 100.4° , the highest point attained during these ten days. As will be observed by looking at the accompanying diagram (Fig. 3), there was no rise of temperature or increase in rate of pulse at the time of the establishment of lactation, a fact of some importance in connection with the theory that the so-called milk fever is of septicæmic origin, as the removal of the uterus prevented any possibility of septicæmic infection from the placental site. On the evening of the fourth day (the 25th), the patient had an attack of colic with some abdominal distension, which subsided promptly after the vomiting of a little clear fluid and the passage of flatus by the mouth and anus.

Fig. 3.

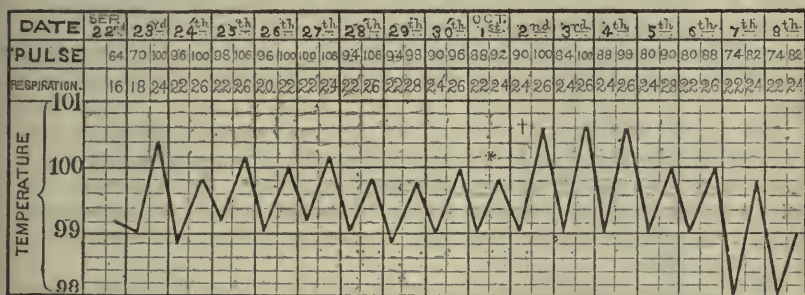


Diagram showing highest and lowest pulse, respiration, and temperature record of each day.

* Sutures removed. † Pedicle separated. Phlegmasia dolens.

On the eleventh day the patient suffered from a mild attack of phlegmasia dolens in the left leg, which was attended with but little fever, pain, or swelling, and which came on without a chill. The temperature for the three nights succeeding reached 100.6° ; on the fourth night only to 100° , and convalescence followed without interruption. The amount of pain experienced by the patient during the entire period was very small, only two grains of the sulphate of morphia having been given including the hypodermic injection of a quarter of a grain immediately after the operation. The bowels were not disturbed until the tenth day, when they were opened by repeated drachm doses of castor oil and enemata of flaxseed mucilage. Four or five natural looking movements followed these measures. On the sixth day, the dressings were first removed. The wound was found to have united by first intention throughout its whole extent and the pedicle to be in a state of decomposition. Notwithstanding union by first intention had occurred, it was thought most prudent to allow the sutures to remain until the tenth day, when they were all removed except the one next the pedicle, which was not taken out until the cavity left by the separation of the latter had partially closed.

The pedicle came away on the eleventh day.

Recovery may be said to have been completed on the seventeenth day, for then the temperature became permanently normal; for prudential reasons, however, the patient was kept in bed until the twenty-eighth day, when she sat up in a chair for the first time. The next day she walked about the room freely, without pain and without fatigue and had not afterwards the least inconvenience from the operation. Throughout the period of convalescence, the patient's tone and spirits were excellent; always happy and cheerful, she had a smile of welcome at every visit, and not a day passed that she was not ready to laugh at anything that amused her; so ready was she to do so, that her hilarity had often to be restrained during the earlier days of her convalescence for fear of injury to the wound and pedicle. A careful record of pulse, temperature, and respiration was kept, and observations of these made every three hours until convalescence was established. A synopsis of this record is given in the accompanying diagram (Fig. 3), in which the highest and lowest observation of each day are noted.

The *pedicle* separated from the living tissue at a point about half an inch below the seat of constriction, and it with both pins and the ligature came away together. The point of separation appeared to correspond with the junction of the cervix with the vaginal walls. On removal of the dead tissue, a depression was left about one inch in depth and about three-fourths of an inch in diameter communicating with the cavity of the cervix. This contracted with rapidity until an opening was left about the size of the cavity of the cervix, which did not heal until the forty-fourth day.

The vaginal discharge for the first six days was scarcely noticeable notwithstanding the fact that I had, two days before the operation, opened a labial abscess which did not heal until two days after. From this time on there was some vaginal irritation with a moderate amount of leucorrhœa, which continued until after the patient was out of bed, but without pain or other discomfort.

The *dressings* immediately after operation have been described; after these were removed, the parts were well washed with a weak carbolic acid solution, and the wound and pedicle dressed with lint soaked in carbolized sweet oil (8 per cent.). This was the daily treatment until a few days after the pedicle separated, when oxide of zinc ointment alone was used. The *constitutional treatment* consisted of occasional small doses of sulphate of morphia and sweet spirits of nitre. After the tenth day tonic doses of quinia and iron were given with a small quantity of brandy, of which she took four ounces in all.

The *food* consisted at first of milk and water, then milk and lime-water, with occasionally a little tea. After the tenth day more substantial diet was added.

Lactation was fully established as, after ordinary labour, the supply of milk being abundant, much more in fact than was needed for the child, and the quality entirely suitable for the nourishment of the infant, which the patient has nursed regularly.

The function of the *bladder* was not at all interfered with. For the first two days the urine was drawn by catheter every four hours, but afterwards at the patient's own request she was allowed to pass it voluntarily. Not only was there no irritability of this organ observable, but she has been able to retain in the bladder as large a quantity of urine as she ever

did, and both the nurse and patient assured me that micturition was at no time abnormally frequent.

The *child*, a male, weighed at birth $5\frac{1}{2}$ lbs., and measured 18 inches in length. The cranial measurements were as follows:—

Diameters	{ Occipito-mental	13	c. m.	(5.1 inches.)
	{ Occipito-frontal	12	"	(4.7 ")
	{ Cervico-bregmatic	10	"	(3.9 ")
	{ Bi-parietal	8.5	"	(3.3 ")
	{ Bi-malar	7.5	"	(3. ")
Circumferences	{ Fronto-mental	27.3	c. m.	(10.7 inches)
	{ Trachelo-bregmatic	32.	"	(12.6 ")
	{ Cervico-bregmatic	30.5	"	(12. ")
	{ Occipito-frontal	34.	"	(13.4 ")

The amount of cranial ossification was not that usually seen at term, but both testicles were descended, and no unusual precautions were required to sustain the child's strength. The absence of the usual correspondence between the bi-parietal and cervico-bregmatic diameters may have been due to freedom from the compression to which the heads of all children delivered through the pelvis are subjected, though, as the parietal protuberances were by no means as prominent as usual, this difference may have been owing to hereditary influences alone.

At birth the child was in a condition of suspended animation, so that considerable effort had to be made at resuscitation, but soon through the intelligent care of Dr. Broomall it began to breathe regularly, and has since been in vigorous health. This condition of asphyxia of the child is usual in a Müller operation.

I have one other fact to note among the symptoms of the patient during the operation. It has been asserted that in a Müller operation at the moment of ligation of the pedicle the patient experiences a condition of shock, with slow, feeble pulse, etc. Dr. Tyson, who watched the condition of the patient during the operation very carefully, has kindly written to me that he observed no such effect, but that, on the contrary, after the patient became fully etherized the pulse maintained a rate of 92 per minute, full and soft, and rather increased in strength during the continuance of anæsthesia.

It is as a rule unwise to attempt to establish theories upon one's experience in a single case, yet the status of the Porro operation with its modifications is of such great importance, and the statistics in this country are at first sight so unfavourable that any contribution to our knowledge of the subject must be of some value. It is quite clear to my mind that the Porro cannot properly take the place of the Cæsarean operation in *all* cases. It is of greater value than the latter, however, under certain conditions, and will frequently offer the prospect of better results. It is more particularly adapted to cases of permanent pelvic deformity at the *brim* from the fact that under these circumstances the presenting portion of the child does not descend into the pelvic cavity, and the os is likewise held at the superior strait; as a result the vagina is gradually elongated by the development of the fœtus, and the growth of the uterus, so that no violence is done to it at the time of operation in the efforts to place the stump

in the lower angle of the abdominal wound. When the deformity consists chiefly of a diminution of the conjugate diameter at the superior strait (the flat pelvis of rachitis, etc.), the placing of the pedicle in the abdominal wound is still more facilitated, for under these conditions the cervix is pushed well forward over the symphysis pubis, so that it is found at the time of operation occupying a position very near the anterior abdominal wall, and but slight traction is needed to place it afterwards in the desired position.

When the cervix is not situated so high up, or so well forward, the chances of the patient's recovery are diminished, unless a safe method of disposing of the pedicle without attaching it to the wound in the abdominal wall can be found. Such a method is probably offered us in that adopted by Gustav Veit, of Bonn, after Schröder, of Berlin,¹ who made flaps in the cervix similar in shape to those made in the double flap of skin and muscle in amputations of the thigh. These he united with sutures, taking care to bring the peritoneal surfaces into close contact. His patient did remarkably well until the fourth day, when she died from an attack of erysipelas of the face, commencing on the previous day. A small abscess was found in each kidney. Should this or a similar method be found to be feasible, then the Porro operation would probably offer advantages over the Cæsarean section in all cases where it is of importance to free the patient from the constant fear of future pregnancies.

My patient received with the utmost delight the announcement that I intended to so operate that she could never again become pregnant. But after all, the most important consideration for the surgeon is the safety of the operation to the mother as compared with that of the Cæsarean section. Abroad this has been demonstrated to be much greater. In localities where for many years the death-rate after the Cæsarean section has been 100 per cent., or but little less, the Porro operation has yielded a fair proportion of recoveries. The great majority of the 55 cases abroad have been performed in places where the Cæsarean section has for years been looked upon as almost necessarily fatal, and yet out of the 55, 23 have recovered. In the United States out of four cases three have been fatal—a most unfavourable record. But let us analyze these.

The first case was that of Dr. Storer, of Boston.² In this case Dr. Storer first attempted to perform Cæsarean section, but found that unless something more was done his patient would expire on the operating table. He, therefore, removed the uterus and ovaries, and ligated the cervix in order to control a hemorrhage which otherwise would have been fatal in a few minutes. The patient lived sixty-eight hours. In other words, in this case Cæsarean section alone was instant death,—ablation of the uterus and ovaries necessitated by ligation of the cervix and broad ligaments prolonged life sixty-eight hours. The profuse hemor-

¹ *Zeltschr. für Geb. u. Gynæcol.*, V. Bd. H. 2, p. 256.

² *Journal Gynæcol. Soc.*, Boston, Oct. 1869, p. 223.

rhage to which the patient had been subjected on account of the attempt to perform Cæsarean section must have had much to do with the fatal result, and could have been avoided if the Porro-Müller operation had been attempted from the outset. The case of Dr. Taylor,¹ of New York, was the second in this country, and its fatal result appears to have been owing to a rare sequel of phlegmasia dolens and the unruly temper of the patient; that is from an unfortunate accident quite as apt to occur after Cæsarean section as after the Porro. The third case, performed by Dr. Agnew, of this city, has not been reported, but was undertaken on account of the existence of a large fibroid tumour filling up the pelvic cavity, and after the patient had been three days in labour.

Is it at all likely that Cæsarean section in these four cases would have shown better results? I think not; in fact we know that the attempt to perform that operation in the first of these was a serious disadvantage to the patient. No patient could have done better after a serious operation than my own. I have never seen more favourable symptoms after an amputation of a finger, and rarely have I seen less discomfort in a lying-in woman after normal labour. From all that can be gathered in regard to this operation, I think we can safely say that under certain circumstances it can be recommended as being safer, and in every way preferable to Cæsarean section. In addition to greater immediate safety to the mother, and her preservation from subsequent pregnancy, it has been thought to cure osteo-malacia—an important advantage over Cæsarean section in cases suffering from that disease.

In regard to the Müller modification it may be said that statistics abroad have been favourable to its advantages over the unmodified Porro operation. Of eight sections performed, after Müller's method, four have recovered. Of forty-seven Porro operations twenty have recovered.

Nothing could be more strikingly beautiful to the surgeon than the Müller operation. It is at the same time clean, safe, and, to any one skilled in the use of the knife, easy to perform. It is clean because the abdomen is closed before there need be any flow of blood, and not a drop of it need enter the peritoneal cavity; safe because all hemorrhage from the general system may be entirely avoided; and easy to perform because every step of the operation is done in sight. There is no danger in this method of leaving an ovary behind, because one can see every part he wishes to remove. The uterus also can be neatly divided, leaving no jagged edges. It is to be doubted whether there is any disadvantage to the patient in a long abdominal incision in itself. The danger of giving foreign matter access to the peritoneal cavity by opening the uterus *in situ* is probably much greater than any likely to occur from a long abdominal wound.

As stated in the early part of this paper, care was taken to operate

¹ Amer. Journal Med. Sci., July, 1880.

before there was any danger that natural labour could come on. When we consider what difficulties there are in the way of getting together the consultants and assistants of our choice, as well as the needful apparatus in an emergency, it will easily be seen that by so doing we give the patient important advantages. It was my request to each of the physicians who were to be present that care be taken to avoid seeing any case of contagious disease on the day of the operation or the day previous. I believe the request was strictly complied with by all, except one gentleman, Dr. J. G. Richardson, remained away on account of the necessity he was under of visiting a case of contagious disease on that morning. Had I been obliged to summon them hastily there would have been no opportunity of observing these precautions. The existence of a well-defined neck of the uterus undoubtedly aided greatly in the application of the *écraseur* and ligature, thus materially shortening the operation. Not the least of the advantages by which the patient and myself were favoured was the presence of the eminent gynæcologists who cordially assisted me in the operation.

Drs. Smith and Goodell extended to me every aid in their power. The former examined the patient with me a few days before the operation, fully approved of what I proposed to do, and saw her, in consultation with me, frequently during her convalescence. To Dr. Harris I am indebted for full access to his very valuable collection of the literature of the subject, which he cordially placed at my disposal. Through the kindness of Dr. Broomall I was enabled to obtain from the Woman's Hospital a skilful and intelligent surgical nurse. But when all did more than I asked of them, it would be invidious to distinguish. I have never seen more united action at a consultation, nor have I ever witnessed a more enthusiastic determination on the part of each to do all in his or her power to promote success, and to the united efforts of all is largely due the honour which belongs to the first successful Porro operation in America.

ARTICLE III.

GASTRIC REMITTENT FEVER OF INFANTS AND YOUNG PERSONS—A DISTINCT DISEASE NOT TO BE CONFOUNDED WITH OTHER FEVERS. By F. PEYRE PORCHER, M.D., Prof. of *Materia Medica* and Therapeutics in the Medical College of the State of South Carolina, Charleston; Ex-Vice-President of the American Medical Association.

WE meet from time to time with cases of remittent fever of greater or less severity in children and young persons, which are not typhoid or malarial; and as we can get no, or scarcely any, recognition of it from those around us, we propose to examine the question of its existence and true status. No practitioner should be indifferent to such a subject—for errors

in diagnosis may lead to fatal results. The cases vary in gravity; but of eighty or more examples—treated by us during many years outside of hospitals, and concerning which we had not the slightest doubt—all have recovered.

In a prize essay (“Illustrations of Disease with the Microscope”), published by the State Medical Association as far back as 1861, we took occasion to give a brief sketch of “Gastric Remittent Fever,” and to assert, for reasons based upon our own experience, that it had a distinct claim to be considered and treated as a separate disease; that it was not a variety, but a true species—as much so as yellow, typhoid, malarial remittent, intermittent, rheumatic fever, or any other classic malady which has been isolated, and marked down as such in nosological tables.

It is singular to observe how all this is ignored, as it seems to be, by the profession generally, and by some of the text-books in particular. We have not searched them all, but Dr. Geo. B. Wood is one among the comparatively *recent* writers who, as far as we know, does give a pretty fair and full account of this affection, and in a measure separates it from other diseases. Very few recent writers place it as a distinct disease under this title in their indexes, or give a separate chapter to its consideration and treatment. Nor do we find it accurately and fully described in their works. The medical journals, as far as we know, seldom or never refer to it.

It is very often, we think, dependent upon, or associated with the presence of worms in the intestinal canal, and many writers, we admit, treat of “Worm Fever;” but we assert most distinctly that gastric remittent fever has often no dependence upon, or relation whatever to parasites in the intestinal canal; that it is a distinct, separate, isolated affection—and not by any means very rare; that it is of the highest importance to recognize it early; that it requires a treatment peculiar to itself alone; and that it is scarcely ever fatal, if recognized and properly managed at its inception. There need be no fatality about it, as there are no lesions which lead to such a result; there being only an irritation of the gastro-duodenal, or gastro-enteric mucous membrane, and no true inflammation, we think, nor any serious organic alteration of the glands, or other important vital organs—as soon as the *irritation* is removed the *fever* ceases! We do not pretend, as a medical Stanley, to have made all these discoveries alone; we only unfurl our flag over lands partially abandoned, after having been once occupied and marked out; for the disease has its history: was long since recognized, known, and described with more or less accuracy and completeness. Our claim is, that as soon as we saw a few cases and examined their essential features, we noticed its dissimilarity to other forms of remittent fever, and it became clear to us that it was as much an entity as any other disease. Among some comparatively recent authors the disease is divided up among, or merged in typhoid, malarial remittent, typho-

malarial, ephemeral, and worm fevers—all which we regard as essentially erroneous. To confound it with these only as respects treatment, is to run the risk of imparting a fatality to it which it need not exhibit.

As for the great majority of the professional brethren in this State, or in our immediate vicinity, they seem to pay little heed, so far as we can learn, to the existence of any such affection; and yet they must necessarily see and treat it under some other name. But a brief while since we heard it stated that no such disease existed—that the cases of it were only cases of aborted typhoid! Our repeated efforts before the “Medical Society” to secure attention to the subject, and a due recognition of the distinctions we assert to exist in the features of the disease, have failed. We seldom or never hear it reported by members, or recorded in the weekly bills of mortality of this city, or of New York—which we have received for years past.

We shall not undertake to give its bibliography, to enter upon any full or critical inquiry as regards priority of description, and the relative contributions made by the several writers who have described the disease; or to cite each of the authors on fevers or on the diseases of children who have either incidentally, or more or less fully, recognized gastric remittent fever as a distinct and separate affection. But we shall certainly, in our effort to bring about a better understanding of the disease, point out any important discrepancies, or omissions, in its history by the several authors who have referred to it. Our readers must now give us their patient attention whilst we examine opinions by writers of reputation and authority—for they are sometimes dangerous.

Dr. W. Butter, in his “Treatise on Infantile Remittent Fevers,” 8vo. London, 1782 (see Copland’s “Dictionary, Art. Fevers”), seems to have been one of the earliest writers who gave a distinctive sketch of this affection—recognizing and describing its most salient characteristics.

Dr. Charles Lee, the American editor of Copland, though he has given an excellent summing up of the varieties of fever (p. 1120), is often far wide of the mark when he speaks of the excessive danger and fatality of “Remittent Fever”—whilst appearing to allude to this form of fever; but confounding it with malarial remittents—with which it has very slight, if any connection. Dr. Lee says:—

“There is no disease of more frequent occurrence in our country than the remittent fever of children, as with the exception of croup, pneumonia, and in the hot seasons of our large cities, cholera infantum, there certainly is none more precarious in its progress, less amenable to treatment, or more fatal in its consequences.”

We are glad to note that Prof. S. H. Dickson (“Essays on Pathology and Therapeutics,” 1845, chap. “Infantile Remittent”), says of it, “if well managed recoveries are the rule.” In fact, we have no form of remittent fever among children at the South to which Dr. Lee’s description, or sinister forebodings would apply. They would hardly be applicable

even to malarial remittents. Several other writers refer to the mortality of the disease in terms which we will show by the testimony of others and ourselves to be very questionable. Some of these authors declare that it sometimes commences with diarrhœa. We have never seen one out of numerous cases begin with any condition save that of costiveness. This, in our experience, ushers in *all fevers*—glandular and secretory action being arrested at their inception—principally, we suppose, from the influence of the increased temperature (*fever*) upon the blood and the nerves which control the functions of the glands. Neither Wood nor Copland refer to the “red tongue,” which we consider as one of the essential and characteristic marks of the disease. Prof. Dickson says that the tongue is at first furred and loaded, and afterwards “fiery red;” strictly the tongue is never loaded—there is only a white fur over the centre—but in the last observation he is accurately correct, so far as the point and edges of the organ are concerned. He does not allude to the inutility of quinia in the treatment, nor to the great efficacy and power of alkalies, such as soda.

Dr. Laycock devotes a chapter to the disease under the title—which we consider to be the only true and correct one—of “Infantile Gastric Remittent Fevers;”—so we are sustained by, and do not hesitate to concur with these earlier writers who regard it as a distinct form of fever, requiring a special method of treatment; and that it should not be considered a “gastric catarrh!”

Some of the authorities do actually regard the disease as aborted or mild typhoid fever, than which nothing, we feel sure, is more erroneous, or shows a greater absence of perception of its true nature. Gastric remittent fever does not present the *facies* of typhoid fever at any period of its career. Its physiognomy is essentially distinct. The tongue may become dry (though we have never seen it so) at the conclusion of protracted cases, but the temperature variation is not nearly so uniform as in typhoid fever. The evanescent delirium and wandering during or upon waking after sleep, sometimes accompanied with hallucinations, of gastric remittent—which also occurs early in the disease, and is the result of too much heated blood in the brain—is a very different thing from this symptom, as it is met with only in the later periods of typhoid fever. In the latter, delirium and coma and dry tongue, with sordes, occur late; and are caused by poisoned blood acting on the nerves, and the brain—thus depressing the nervous centres, and diminishing the activity of the excretory glands. In gastric remittent fever the intelligence is good, save during the temporary and fugitive delirium; the eyes are clear, and perspiration occurs only at the crisis just preceding convalescence. The tongue is always and necessarily red and pointed—what we call the snake’s tongue—though white in the centre, it is never foul or loaded. Most of the authorities we have referred to, and others consulted, admit that worms are not the sole cause of the disease; one or two assert (erroneously we

think) that they never are. Dickson says they certainly are not the invariable cause. Our esteemed and indefatigable friend, the late Dr. Condie, can scarcely be referring to so benign and easily managed a disease as gastric remittent fever, when he states ("Diseases of Children"): "In every instance it is either a gastro-enteritis, an ileitis, or an enterocolitis accompanied with febrile reaction;" and he remarks that the lesions discovered after death "are chiefly inflammation, more or less extended, of the digestive mucous membrane, in some instances of the stomach and upper portion of the small intestines; in most instances of the ileum and colon." He even speaks also of peritoneal inflammation as a complication, and he advises leeching, etc. The disease we are describing is not concerned in any of its stages with this membrane; in it we have never even seen enlargement of the mesenteric glands.

Copland only, whilst referring to "Complicated Remittent," speaks of "inflammatory states of mucous membrane," and "a foul, loaded tongue with red sides and apex." We would hesitate to describe gastric remittent fever, as we meet it, as an *inflammation*. It is scarcely more than a gastro-duodenal *irritation*—with sufficient intensity only to cause fever, being the result of depraved digestion. But it is difficult to declare when an irritation merges into an inflammation—this being often a question of plus and minus. The irritation, whatever be its nature, certainly is sufficient to cause fever. Evanson had noticed that any exciting cause of irritation, "as swallowing a marble, will give rise to a remitting type with evening exacerbations."

Niemeyer includes in one chapter "Gastric fever, Catarrhal, and Bile fever" under affections of the "*Intestinal canal*"—having before treated of "Acute gastric catarrh" in his section on "*Diseases of the Stomach*." In his Catarrhal fever there is immense excretion and discharge of mucus—the tongue being first coated and furred, afterwards glazed and fiery red. We have never seen this disease; and we never could comprehend why the Germans, and their followers in this country, call so many of their cases of intestinal irritation "catarrh!" In our gastric remittent fever the skin is dry, the system is parched by fever, and there is no secretion of mucus as a distinctive fact from the stomach or intestines; none is either vomited or passed downward in any material amount. We think it advisable to quote what this able writer says of "Gastric Fever," which approaches nearest to the disease that we are considering. We cannot agree with regard to the *exceeding pain* about the joints and limbs, which with us is only found in influenzas, grippe, dengue, etc.; and he fails to notice the red and pointed tongue—which we assert to be obviously an essential characteristic of gastric remittent fever. With these exceptions, one cannot too highly commend the following:—

"Many physicians, particularly among the Germans, describe as *gastric fever* a disease running an acute course, in which high fever is only accompanied by dyspeptic symptoms, and generally by diarrhœa, while there are usually no symp-

toms that would indicate severe disease of any important organ. Celebrated authorities, particularly those clinical observers who have developed in hospital, and have had only hospital practice, consider all cases of so-called gastric fever as mild cases of typhus. I cannot at all agree with this view. Every physician in private practice often has the opportunity of seeing, after errors of diet, without any suspicion of infection, symptoms of variable duration, which exactly answer to those of gastric fever. If this be so, even where we can find no error of diet, we must be careful about inferring that there is an infection, and must acknowledge the possibility that catching cold, atmospheric and telluric influences, and other sources of injury, may excite a similar set of symptoms. But I will not attempt to deny that numerous slight cases of typhus are diagnosticated as gastric fever.

"As a rule, gastric fever begins with several slight chills, rarely with one severe one. The pulse quickly rises to 100 or more. According to the few observations that have been made, the temperature is sometimes normal, in other cases it is decidedly increased; it may reach from 102° to 105°. The constitutional disturbance is very marked. The faintness is so great that the patient remains in bed; the limbs, particularly at the joints, pain 'as if they would burst.' The insupportable headache is usually increased by laying the head on a feather pillow, while it is occasionally relieved by binding a towel firmly around the head. The patient does not sleep at all, or is disturbed by dreams. The symptoms of disease of the stomach or intestines vary. Usually the appetite is lost, the tongue coated, the taste slimy or bitter, the breath is bad, the patient complains of a feeling of pressure and fulness in the epigastrium, and is sensitive to pressure there. There is also eructation of gases and fluids, usually acid products of abnormal gastric digestion. Occasionally there is repeated vomiting. At first there is usually constipation; but later, particularly when the disease is protracted, there is diarrhœa, preceded by more or less colicky pain; the stools are fluid, and coloured green by bile, and are sometimes mucous.

"Occasionally these symptoms pass off quickly, and the patient, who is one day in a sad plight, feels quite well the next (ephemera). At the same time herpetic vesicles not unfrequently come on the lips. We should not consider this a distinct disease, a febris herpetica. Herpes labialis accompanies gastric fever as often or perhaps oftener than it does pneumonic or intermittent fever, and has the same significance in the former disease as in the latter. But the disease does not by any means always terminate in one day; it often continues several days, but rarely longer than a week. In persons who do not bear well the feverish increase of temperature, or the consumption caused by the increased development of heat (we have frequently said that individual peculiarities vary greatly in regard to this), there is great depression, the mind is affected; instead of dreams, the patient has delirium; and, if at the same time the tongue becomes dry, the similarity with typhus is very great. It often happens that the true nature of the case is only explained at the sixth or eighth day, by the sudden improvement and the rapid convalescence."

And here our author takes occasion to warn the physician against being in error in the diagnosis, as he says "even the laity no longer believe that under certain circumstances 'gastric fever' may become 'gastric nervous' and this again develop into 'nervous fever.' They know that these two diseases are of different nature from the first." He tells you how they may be distinguished.

Niemeyer says: "Muriatic acid has a great reputation in the treatment of gastric fever" (3ss to ʒvi of mucilage), furnishing "the gastric juice with the acid to which, as physiology shows, it owes its digestive powers." We have never used acids in our gastric remittent fever—though we have found acids, with gentian, to act brilliantly in certain forms of dyspepsia attended with eructation, which, on that account, are very depressing. "In

catarrhal fever we prescribe," says Niemeyer, "the alkaline carbonates, particularly the tinct. rhei aquosa"—in large doses, as advised by Schonlein—"and can fully support its recommendation as almost a specific in this disease." He elsewhere says: "This evidently depends upon the well-known power of the carbonates of the alkalies to diminish the tenacity of the mucus and render it more fluid." As we said before there is no mucus in gastric remittent fever. We can certainly speak in as high terms of nitre as a diaphoretic, united with soda as a corrective, in our form of fever.

Dr. Flint, in his "Practice" (4th ed., Phila., 1873), describes the disease under consideration, as well as we can discover, under the head of "Subacute Gastritis," and he only refers incidentally to gastric catarrhs; nor is the line drawn very strongly between the two affections, as is done by Niemeyer. Though this distinguished observer advises vermifuges where worms are supposed to be present, he lays no stress upon the verminous origin of fevers in children. In this we think he is mistaken—many cases of gastric remittent fever in children we have traced to the irritation caused in part at least by the presence of worms, as well as by any other irritant. We are glad to find that Flint sustains the opinion that it (subacute gastritis) is very seldom fatal.

Dr. Geo. B. Wood, in his "Article 1st, Irritative Fever," says:—

"*The Infantile Remittent Fever* of authors, so far as it is a distinct affection, is an example of simple irritative fever. Under that name, however, have been described several different diseases, resembling each other only in their febrile and remittent character, and in the circumstance of occurring in children. Gastritis, enteritis, mesenteric adenitis, hepatitis, tubercular disease of the lungs and bowels, and especially enteric or typhoid fever, have been confounded under the vague title of infantile remittent fever." . . . "Yet there can be no doubt, I think, that a remittent irritative fever, corresponding with the definition given, at the head of this article, does frequently occur in young children. Unless in consequence of the supervention of inflammation, which places the disease among the phlegmasiæ, it almost always ends in recovery."

Only a misconception of the nature of the disease, and the abuse of purgatives, could induce this conversion, we believe. He regards it as "identical with worm fever," and distinct from enteric fever. ("Practice of Medicine," vol. i. 220.)

That we are correct in our opinion of the importance of a critical inquiry, inasmuch as the profession seems to be at sea on the subject, we need only quote also the opening paragraph from Dr. J. Lewis Smith's chapter on "Remittent Fever" in his "Diseases of Infancy and Childhood," Phila., 1876.

"If a physician were to consult the standard treatises on diseases of children, in order to ascertain the nature of remittents he would rise from the perusal with no clear idea of it. One tells us that the remittent fever of children is identical with typhoid fever of adults; another, that it is a gastro-intestinal inflammation; and finally, Hillier believes that there is properly no such disease, and that the term should be dropped from the nosology of children. There is, however, a remittent fever of children as well as adults, and much of the confusion which exists in reference to it arises from the fact that writers have not kept in view what constitutes a fever. Febrile action which has a local cause is not an essential fever, and should not be described as such."

Smith does not devote fifteen lines to the treatment, nor three pages to the whole subject. "If we have ascertained by a careful examination that the fever is remittent, and not symptomatic but essential, there is one remedy which is required in nearly all cases, namely, quinia, or its equivalent, cinchonina." Quinia is useless in true gastric remittent fever! As we have shown by its actual test in five obstinate examples, and by curing without its use every other case.

So able and generally satisfactory a writer as Jno. Syer Bristowe ("Practice of Medicine," Phila., 1876) gives a very brief, and we must say a most inadequate, sketch of "remittent fever," and makes no allusion whatever to the infantile form of it. He says that intermittents and remittents are convertible the one into the other as accident determines, and that there are no distinct lines of demarcation between them. *Gastric* remittents never become intermittents! As they depend upon a local irritation for their cause, and not upon malaria, their symptoms cannot intermit. Their remittent character is preserved up to recovery.

We desire to be concise in the sketch of the disease as seen by us. We entitle it "Gastric Remittent," because the stomach itself (and perhaps the duodenum, for it is difficult to fix precise limits), and not the intestines, as in a true enteric fever, like typhoid, is the seat of the disease; and, not to refine too much, it is not necessarily "infantile" in the strict sense of the term. There are always daily remissions, which have not the regularity that is found in typhoid fever. The absence of the gravity, the distress, and other symptoms belonging to the latter, which it is needless to mention, strike the beholder at the first view of a typical case of gastric remittent fever.

Sketch of the Disease.—A child, or young person, living in the city of Charleston, for example, if breathing marsh malaria at all, very rarely receives it in so concentrated a state as to suffer by this cause alone from intermittent, from congestive, or even from what may be styled an attack of bilious remittent fever. But should the same child be subjected to a repeated or long-continued course of improper nourishment, including all things that are hurtful—cakes, confections, unripe fruit, etc.—after a time nutrition becomes impaired or arrested; the necessary digestive juices being imperfectly elaborated from the irritated and depraved condition of the mucous and glandular structures, effete matters accumulate in the system each day more and more; the wheels of life are finally clogged, the play of affinities between the organs are disturbed or arrested, and fever is declared. The source of this fever is local, and its cause, irritation, of course. Every thing has been slowly conspiring to this end, but it requires sometimes the addition of a cold, perhaps, or other disturbing cause, to develop the fever, which is not an intermittent, but a *gastric* (or *gastroduodenal*) *remittent*. It is always a *remittent*, generally lessening

during the early morning, to be increased at night, until it slowly disappears after one or more week's duration, when the local effects of the irritants are removed. Sometimes, though rarely, the fever is very high, but it varies in intensity in proportion to the sum of the causes which produce it, and the strength of the constitution; by which term we mean the general endowment which the organs of the individual possess for performing their healthy, normal functions—and consequently for regaining those functions when impaired by excesses. Even when a cold, or other accidental additional cause, does not hasten the development of the fever, it is produced suddenly—*d'emblee*, as the French call it—seemingly by an effort of nature to rectify the abnormal condition, gradually induced by the depraved state of the nutritive organs, which has reached, as it were, its climax. But this fever is much more than a mere *gastric embarrassment*, if it is not a direct result of gastric, or gastro-enteric irritation, or inflammation. We incline to the belief that it is nothing more than an irritation—but drastic purgatives might intensify and prolong the mischief, and convert this into an inflammation. Copland affirms that it is decidedly *not* an inflammation. At any rate the *fever* indicates the general disturbance—the commotion of nature, as it were—accompanying the efforts of the system to throw out the morbid products generated. The remedial measures, which will be given in detail afterwards, tend logically, we may say, to aid in restoring the imprudent—oftentimes innocent—sufferer to his pristine condition.

When one, whether child or adult, with these gastric or gastro-enteric complications removes to, or resides in a malarial region, he is liable to suffer from the usual result of malaria—which, *when it affects any system with healthy organs*, produces only *intermittent* fever, or chill and fever. But under the conditions just specified the attack must necessarily be *superimposed upon the gastric or gastro-enteric derangement*—whether this be irritation or inflammation; and the resulting fever, when this complication exists, in our opinion, will invariably be a *remitting* fever; and the treatment, to be safe and quick, must be directed to both conditions or elements in the disease which results. In other words alteratives, revulsives, antipyretics, cold applications, must precede or accompany the use of quinia or other mere antiperiodic; for we have in both cases an irritated or congested condition of the gastro-duodenal mucous membrane *plus* the malarial poison.

Gastric remittent fevers, be it observed then, *are not confined* to cities; but they *may* occur just as frequently (though probably under a graver type by reason of the greater amount of malaria in the country), in situations where fevers of paludal origin are rife, and where *malaria* is generally, but often erroneously, thought to be the *sole cause* of all the remittent fevers which manifest themselves—thus often leading to great errors, or

important omissions in treatment. We shudder to think how many cases of uncomplicated gastric remittents have been unrecognized and mistaken for malarial fevers. Uncomplicated gastric remittents can also be met with on the highest mountain plateaus, where not a whiff of malaria exists. If this be true, surely then malaria need not always enter as an element in the problem of treatment.

We say, therefore, that a fever with a gastric or a gastro-enteric complication is always a remittent or, possibly, a continued fever, because we believe that the *constant presence* of the gastro-intestinal irritation, maintains and keeps up the continued circulatory excitement and pyrexia (*fever*, in other words)—the malaria being responsible only for the periodicity.

Often, were it not for the gastric irritation, or the weak organ, the fatigue, the exposure to a sudden change of temperature, the individual would escape even though exposed to the malaria—and thus many do escape. At any rate there are two important elements referred to above, either or both of which may be present, and which have to be considered in the treatment.

We may refer in passing to a third form, namely to *bilious* remittent fever—using it as a distinct term—because we believe that remittent fevers occurring in malarial regions are often accompanied in dissipated persons, or those of bilious temperament, by marked disturbance, congestions, etc., of the biliary organs—the liver being implicated, in addition to the gastro-duodenal tract, much oftener than either in intermittents or in the gastric remittents which we were describing. We never hear of a *bilious intermittent*! But intermittents, agues, chill and fever lead to chronic enlargement of the liver, spleen, and mesenteric glands, followed by anæmia, leucocythæmia, and other blood degenerations—which are natural results of the congestions occurring in these blood-making organs during the cold stage. These results never occur in gastric remittent fever.

Now gastric remittent fevers, as we have said, are a not uncommon form of disease, particularly among children in the city of Charleston. They are *characterized* by a not very high thermometric range—100° to 103°—by a slight tenderness upon pressure over the stomach and duodenum, by a mild and evanescent delirium specially upon waking, even during the day; by the absence of the characteristic look of typhoid fever—that of lowness, depression, and exhaustion—and by a tongue *pointed* and *red* at the point and margin, with a white fur in the centre. The tongue is seldom if ever what is called foul, or loaded, as in bilious, and sometimes in intermittent fevers; nor has it a yellow fur as in disorders where the liver is particularly involved. We do not regard the recognition of the exanthem of typhoid as essential to its diagnosis—but we certainly will not find it in gastric remittent fever. We have never met with herpes labialis in any of our cases.

Treatment.—It follows naturally that gastric remittent fever can be brought to a successful termination: never by quinia alone, as in pure intermittents, but by mild mercurial alteratives (a half to three or four grains of calomel, two to four of magnesia and rhubarb each, to which the same quantity of soda is added—occasionally used at the beginning of the disease merely to act as a corrective and laxative—one powder being often sufficient; a few grains of Dover's powder may be given at night occasionally, or after the above alterative laxative powder has acted. The following combination has, in our experience, been sufficient in all cases to reduce and abolish the pyrexia:—

R. Sweet spirits of nitre, ℥j-ij; sup. carb. of soda, ℥ij-iv; water to ℥viii.—M. S. A tablespoonful every two to four hours, as long as the fever exists. Lime-water, or other similar agents, may be given repeatedly. Revulsives of mustard should be applied to the abdomen at least twice a day, and mustard foot-baths ordered at night, so as to assist in removing the gastric irritation—with cold sponging to the head and arms freely and continuously employed for ten to fifteen minutes at a time, whenever the fever rises. These measures combined reduce temperature, correct the gastric derangement and prevent delirium. Quinia may be employed afterwards, if at all, only as a tonic. Such a course of treatment it may be safely asserted scarcely ever fails—never in our experience.

The nitre in the above prescription reduces the fever, and the soda corrects the disordered condition of the gastro-duodenal mucous membrane. We sometimes add one or two drachms of camphorated tincture of opium to this mixture, and, if the fever is high, one or two drops of tincture of aconite to each dose.

The following passage we translate from M. Mialhe (*Chimie Appliquée a la Physiologie et a la Thérapeutique*, Paris, 1856) to show that it is not easy to exaggerate the effects of soda—regarded by superficial observers as a corrective of acidity only.

“Alkaline agents (of which the preference is not important, potash being quite as good as soda) give rise to and disengage ammonia in the system. . . . The alkalis by reason of their importance in the natural phenomena of decomposition, of absorption, of oxidation of sugar and starchy substances, of fatty matters, oils, and resinous substances, are at the head of the most useful and much used medicines. They maintain the blood in its necessary degree of viscosity, fluidify its too great coagulability, increase circulation, dissolve the principal elements (albumen and fibrine), which constitute the bases of nearly all engorgements. They liquefy the elements of the bile, prevent them from becoming thick, from concreting together, from forming calculus. They reanimate and regulate intestinal digestion; facilitate the secretions; saturate the acids, which, taking their origin within the economy, can, through their excess, occasion disease: such as gout, rheumatism, diabetes, or those insoluble collections constituting chalky concretions, urinary calculi, deposits, etc.”

Copland recommends sulphate of potash and rhubarb as a mild laxative in gastric fever; and we have seen our friend and former colleague,

Dr. D. J. Cain, now of Asheville, N. C., employ it successfully; used at the inception of the attack.¹

Let us relate briefly two *cases* for the instructive contrasts they afford:—

CASE I.—A lady in good health, residing in a pine-land summer resort, of doubtful reputation as regards health, after undergoing much anxiety, much fatigue, and exposure to night air, fell ill of fever with repeated chills, and refusing to take quinia died in twelve days of algid fever. Though not managing her case, she was all the while immediately under our eyes.

CASE II.—Her daughter, aged 8 years, also a healthy girl, was taken sick a fortnight after. During the illness of the mother and previously, a careless nurse had given her everything that was hurtful to her digestive organs—she had also been exposed to cold, etc. Living in the same house with these cases, and the last falling under our care, we did not hesitate to pronounce it one of uncomplicated gastric remittent fever. She had fever for a fortnight with daily remissions, and she had the treatment indicated above: A few grains of calomel and rhubarb at the beginning, the febrifuge mixture of soda and nitre, a few grains of Dover's powder at night, cold sponging to the head, hands, and arms, mustard plasters to the pit of the stomach, with hot pediluvia at night. Though she seemed quite ill, she recovered perfectly without taking a single grain of quinia—notwithstanding the history of her mother's case fresh in our recollection—and with its warning against the danger of omitting the use of antiperiodics. It required all our courage to neglect this warning—in the face, too, of the outside clamor.²

¹ The following was received from Dr. S. Baruch, of Camden, S. C., in reply to a letter:—

“The disease you allude to as gastric remittent is one that I have recognized and treated long ago. It occurs chiefly in children, but not exclusively. It is distinctly remittent, but does not yield to quinia until the *primæ viæ* are thoroughly restored. There is excessive proliferation of epithelium, with secretion of—or rather formation of mucus, giving rise to what the Germans call gastric catarrh. The treatment I follow is a dose of calomel and rhubarb to cleanse and prepare the way; then aconite and nitre, sponging, and other expectant anti-febrifuges. I order a dose of quinia early in the morning, but I find that it does not prevent the accession of fever, until the mucous membranes are relieved of the mucus and their epithelium. I use quinia in repeated doses, feeling my way until the effect is pronounced. The difference between this fever and malarial remittent is pronounced in the efficacy and immediate antidotal effect of quinia in the latter, and the difficulty of effecting a prevention of the exacerbation in the former. In the one (malarial) it acts as an antidote and specific against malarial infection—in the other its influence is upon the nervous system, preventing a return, just as it does in intermittent neuralgia (not malarial). It approaches a low fever, presenting typhoid symptoms, but the bowels are not easily moved. It is an obstinate affection, yielding only after considerable medication. I believe it has some tendency to self-cure, but this can be aided materially by treatment. Such is a brief and imperfect view of gastric remittent as I have seen it.”

² We may be pardoned for relating the following as a war record: We attended a young gentleman in Virginia who was believed to be desperately ill by all who were around him; as he had a persistent, high fever for many days, and even in daylight, when awake, was delirious—seeing objects such as is common to those with delirium tremens. We have seen this symptom three times in cases of gastric remittent fever. We assured his friends that it was a case of gastric remittent fever, and that notwithstanding sinister appearances, he would surely recover. This prediction being verified, the grateful mother gave us a *kat* which cost in Richmond \$250—in Confederate money!

The frequent and prolonged use of calomel and opium, or of purgatives, for days—which are, or were supposed by some, essential to the relief of gastro-intestinal inflammation, as well as to the management of the so-called bilious or country fever,—or an exclusive reliance on quinia, are uncalled for, if not decidedly injurious in cases of gastric remittent fever.

In bilious remittent fevers of great violence, dependent upon great intensity of the malarial poison, and where there is evident torpor, or congestion, or chronic disease of the liver, calomel and quinia, with other appropriate means, may be used before the paroxysms often with great advantage. But mercury, calomel and opium, or drastic cathartics, need not be given every four or five hours for days—as was once, may be is now, the practice with some—for their supposed curative powers *in any fever*, save the guarded use of calomel and opium as an alterative absorbent in inflammations of the fibrous or serous tissues, pleuritis, peritonitis, iritis, etc. Some believe that the opium alone is sufficient. Thus given it *irritates and keeps up* the gastro-enteric irritation, or inflammation, and with it the fever and general excitement of the system. We have treated ninety cases of malarial fever in the Marine Hospital, Charleston, many of them of great severity, with but one death—where only a single initiatory dose of calomel was given occasionally. Sulphate of cinchonia was used to test its virtues as an antiperiodic. (See report in *Charleston Medical Journal and Review*, vol. xiii., 1858, and “Prize Essay,” p. 69.)

Agues, pure intermittents, and fevers of verminous origin, are very different things. In these a single mercurial laxative, quinia, arsenic, or an appropriate vermifuge are amply sufficient, because it is of unmixed malarial origin in the one case, and the existence of a parasite in the other—hence the specific or the vermifuge is omnipotent.

These distinctions must be kept ever in mind, in order to avoid useless or injurious medication, or the omission of that which is essential.

ARTICLE IV.

AMAUROSIS FROM LESIONS OF THE EYEBROW OR ORBITAL REGION. By J. SANTOS FERNANDEZ, M.D., of Havana. Translated from the Spanish by A. B. DE LUNA, M.D., of New York.

WOUNDS of the superciliary region, and the loss of sight which often follows, have always been studied with much interest, but so far no satisfactory explanation has been offered regarding the relation between the solution of continuity and incidental amaurosis.

Previous to the discovery of the ophthalmoscope many cases had been reported, but they are as vague as the more recent reports in which an examination of the internal eye has been neglected. That the ophthal-

moscope alone could solve the difficulties which envelop the matter is not so sure; but there is no doubt that a number of cases, watched from the beginning, and subjected to examination of the interior of the eye, would throw much light on the subject, and greatly reduce the difficulties now in our way.

The experiments of Vicq d'Azir on the lower animals for the purpose of solving the problem, are also lacking in the means of investigation furnished by the ophthalmoscope, and it may be stated that at present, and not excepting my own, no complete reports of cases exist, for often if we are called to the patient immediately after the injury was received, he is not seen again at a later period; whilst, on the other hand, if the case presents itself after the occurrence of the amaurosis, seldom can we obtain a satisfactory account of the facts as they occurred.

A brief exposition of the manner in which the subject has been at various times considered may not be amiss here, and to avoid a retrograde review from the year 1838, I will refer to a memoir published at that time by M. Canstatt, of Ratisbonne.¹ According to this writer the various views advanced can be classified into two leading beliefs, viz., that entertained by those who regard lesions productive of dilatation of the branches of the fifth pair of nerves, and contusions or wounds of the same, as the cause of the amaurosis; and the one cherished by those who believe the loss of sight incidental to the violence of the traumatic shock, laceration of retina, or to lesions or inflammation of the brain and its envelopes. The first class of observers appeal, in support of their opinions, to clinical observations; to the experiments of Vicq d'Azir² and Magendie,³ who produced blindness in animals by wounding the fifth pair; and to the case reported by Beer,⁴ in which the amaurosis was due to incomplete division of the frontal nerve, the cicatrization being productive of thickening, which he relieved by deep incisions upon the nerve tract restoring sight. The second party do not regard lesions of the fifth pair as productive of the amaurosis, nor do they consider that nerve as directly connected with the visual function.

M. Canstatt adds that an examination of the theory advanced by the first class of investigators will reveal that the observations upon which it is based are incomplete or capable of a different interpretation, and in proof thereof he divides the reports until then published into two classes according to the seat of the lesions.

1st. *Injuries of the external or internal angle of the eye.*—Under this head must be included the case reported by Camerarius, in which the

¹ De l'Amaurosis consecutive aux Lesion traumatiques de la Region sus-orbitaire, par Canstatt, de Ratisbonne. *Annales de Oculistique*, F. 1, p. 191.

² *Journal Complementaire des Sciences Médicales*, v. xlv. p. 201. Paris, 1832.

³ *Journal de Physiologie*.

⁴ *Lehre von den Augenkrankheiten*, vol. i. pp. 176, 185, 189. Vienna, 1813.

wound was in the internal angle of the left eye, vision being extinct, though perfect in the right; paralysis of the upper lid, and also of the whole right side of the body. The loss of sight and cerebral symptoms were equally manifest, and the former cannot well be attributed to an injury of the fifth pair.

With the foregoing is classed Morgagni's case of amaurosis following an injury of the external palpebral commissure; although the same case presented a wound under the eyebrow on the same side, a fact which renders it not exclusively illustrative of the influence upon sight of lesions of the fifth pair.

2d. *Injuries of the superciliary region itself.*—Here is comprised the case reported by Petit of the officer who was blinded by a sword wound on the region of the brow. Canstatt observes that the blow might have been severe enough to cause some cerebral shock or lesion capable of occasioning amaurosis, a suggestion confirmed by the case presented in Roux's clinic. Here a woman fifty years old, and of good constitution, received a wound in the superciliary region apparently very slight. There was no loss of consciousness, and the patient presented no untoward symptom for several days, when she began to feel acute pain at the seat of injury, accompanied by bleeding; this was soon followed by delirium, tumefaction of surrounding tissues, amaurosis on the affected side, hemiplegia, coma, and death. The autopsy revealed effusion in the dura mater on the side of the lesion and suppurative of the right hemisphere. Guersant's case also corroborates Canstatt's suggestion. A little girl falls, receiving a blow on the external end of the eyebrow, and five days after—having in the mean time shown nothing unusual—she is seized with coma, dilatation, and immobility of the right pupil, blepharoptosis of the corresponding side, paralysis of the extremities, and death. At the *post mortem* serous effusion and cerebral softening were found, the optic coverings and the fifth pair, at its origin, being perfectly sound. Canstatt himself saw a farmer who having been butted on the temple by a bull suffered as a consequence amaurosis of the injured side with marked dilatation of the pupil and cephalalgia. "This case," he observes, "might be interpreted to favour the views I oppose, but I am so far from believing the lesion of the fifth pair as causative of the amaurosis, that I admit at once that the violence of the blow produced a shock resulting in laceration of the retina, or a more profound lesion of the brain. Morgagni has already called attention to this point in several cases reported."

In regard to the experiment of Vicq d'Azir and Magendie, on the lower animals, Canstatt favours their repetition, that they may furnish a base for such important deductions, suspecting, with others, that Magendie's experiments were too carelessly performed to accept, without question, that the fifth pair alone, and no other portion of the brain was touched. "That physiologist," says Canstatt, "wounded the intracranial portion of the

trigeminus, and his experiments cannot be cited in support of the amaurosis incidental to injuries of the supra-orbital nerve." Adding on the other hand that Magendie's views are in direct opposition to those held by Vicq d'Azir; the latter believing that lacerations and contusions of the frontal and supraorbital branches of the fifth pair are followed by immediate loss of sight, while the former regards irritation of said branches amongst the curative means for the blindness, asserting that their subjection to galvano-puncture is not prejudicial to vision.

In concluding Canstatt refers to the fact that Ribes¹ has undertaken to demonstrate anatomically the participation of the fifth pair in the act of vision, asserting that the ciliary nerves do not terminate in the iris, some extending to the retina, and Wardrop's admission that the vascular coat of the retina is supplied from the ophthalmic ganglion. Also that Beer's statement that section of the distended nerve results in a cure has been disproved by Hennen² and Guthrie,³ who divided the supra-orbital nerve without relief.

M. Canstatt's memoir is a *résumé* of all that relates to amaurosis from injuries of the eyebrow up to the end of the fourth decade of the present century. Since then other authorities have merely repeated the same, the views advocated by Canstatt still prevailing, and in spite of the knowledge at present possessed of the functions of the fifth pair, its influence in the production of amaurosis has not yet been universally denied.

As a rule modern works on ophthalmology do not consider this lesion in a separate chapter, although Galezowski⁴ does so, explaining this variety of amaurosis as occasioned by laceration of the optic nerve, or its compression in the optic foramen.

Wecker,⁵ alluding to wounds of the lids and eyebrows, says:—

"In those of the latter region involving the supra-orbital nerve, the dreaded complication occasionally supervening, viz., total blindness of the corresponding eye, constitutes a very important point. Of course, cases where the wound is accompanied by shock to the orbital region of the cranium, of sufficient severity to account for the functional disturbances of sight immediately following, should be excluded. Also such others where the supra-orbital nerve has been wounded by sharp-pointed weapons, which may have penetrated deeper than at first sight supposed, and thus occasioned inflammation of the deep regions of the orbit or coverings of the brain (Petit). Eliminating the above cases, very few remain of uncomplicated lesions of the supra-orbital nerve determining the complete amaurosis supposed by Sabatier and Beer as sympathetic, and due to the intervention of the nerve filament of the nasal branch which participates in the make up of the ophthalmic ganglion. According to these observers this sympathetic amaurosis could only occur during cicatrization when the nerve is subject to continued tension from nodular retraction.

"It is to be regretted that the greatest number of this class of cases were ob-

¹ Mémoires de la Société Médicale d'Emulation, t. vii. p. 99. Paris, 1811.

² Observ. on some important points in Mil. Surgery, p. 266. Edinburgh, 1818.

³ Lect. on the Oper. Surgery of the Eye, p. 702. London, 1823.

⁴ Traité des Maladies de Yeux, par Galezowski, 1875.

⁵ Wecker, t. ii. p. 187. 1870.

served at a time when exact means to determine changes in the optic nerve were not known, and when alterations of sight from paralysis of accommodation were easily overlooked. It must be admitted, however, that prolonged irritation of a branch of the fifth pair might be transmitted through the filament that reaches the ophthalmic ganglion, thus propagating to the eye an irritation of the nerves of general sensibility, which, as is well known, govern the intra-ocular secretions. Hence, a hyper-secretion of liquids in the interior of the eye, resulting in a simple form of chronic glaucoma, may be for a long time mistaken for amaurosis.

“Numerous instances of section of the supra-orbital nerve in the treatment of morbid conditions, go to show, as well as the experiment of Vieq d’Azir, Magendie, and Romberg, that simple wounds and sections of this nerve are not sufficient to determine sympathetic irritation of the corresponding eye. To bring about such results the presence of continued irritation becomes necessary, as for instance that occasioned by cicatricial adhesions to the bone, partially depriving the skin of its mobility. Beer’s advice, therefore, to complete the section, or excise the cicatrix, in wounds of the supra-orbital nerve deserves notice.”

Wecker, without alluding to a single clinical fact, gratuitously attributes the amaurosis due to wounds of the eyebrow to glaucoma from irritation to branches of the fifth pair, propagated through the ophthalmic ganglion to the nerve filaments governing intra-ocular secretions. Galezowski,¹ on the contrary, asserts that in a certain number of cases examined by him with the ophthalmoscope he has discovered a whitish state of the optic nerve, not very pronounced, and unaccompanied by excavation, or other change in the internal membranes of the eye.

Of the five cases presented further on, in three, I have observed an undoubted atrophy of the papilla, and in the remaining two loss of vitality, and rapidly approaching atrophy. In none could the existence of glaucomatous phenomena be suspected either from objective or subjective symptoms; and if Wecker would explain the amaurosis through the agency of the fifth pair, by the supposed development of glaucoma such opinion is not based on a single clinical observation as far as I know.

Given the existence of visual disorders due to dental affections and through the intervention of the superior maxillary nerve, it would have seemed more reasonable for him to find points of analogy between the one and the other. He overlooks Beer’s advice to destroy the cicatrix effecting compression of the supra-orbital nerve, for the relief of the amaurosis, as the extraction of the tooth causing visual derangements is advocated for their relief. If the disorders of vision, due to the agency of the maxillary nerve—itsself the subject of some dental trouble, are not of a glaucomatous nature,² why should those in which the supra-orbital nerve is a factor be so considered?

In support of the reasoning herein advanced are the statements of M. Berlin on the disorders of sight due to wounds of the skull, made before the Heidelberg³ Congress.

¹ Loc. cit.

² Wecker denies the existence of intra-ocular lesions in his cases of visual derangements from dental troubles. (Treatise on Diseases of the Eye.)

³ Journ. d’Oculistique et de Chirurgie, No. 88, p. 233, June, 1880.

"These disorders," he says, "are the result neither of shock to the retina or optic nerve, nor of reflex amaurosis from lesions of the fifth pair. They generally follow fractures of the skull from injuries to the frontal bone, and particularly when inflicted on the orbital prominence, the root of the nose, and the malar, temporal, and sometimes the occipital region. The nature of the lesion may be a stroke of lightning, blows from the fist, or bodies falling on the head, and falls on the cranium.

"As a result of these injuries undoubted symptoms of fracture of the cranial bones, or of cerebral shock have been observed. Intra-orbital hemorrhages with exophthalmia, multiple paralysis of the muscles of the eye, paraplegia, loss of the sense of smell, aphasia, and general anæsthesia of more or less duration are apt to occur. The disorders of sight under consideration are the result of fractures of the root of the orbit in which the optic nerve is directly or indirectly implicated."

Hölder collected 168 cases of fracture of the skull, of which 88 were of the base and 80 of the roof of the orbital vault. Prescott Hewett gives 23 of the latter and 68 of the former variety, and Schwarz 66 of the orbital vault and 102 of the base of the cranium.

In the 80 cases of fracture of the roof of the orbit mentioned by Hölder, in 54 the fracture involved the optic foramen. The optic nerve was partially or completely ruptured, and presented hemorrhagic foci in its substance, blood being effused under its sheath in 42 instances. The displacement of the bony fragments of the optic foramen directly injures the nerve, and hence unilateral, complete and incurable amaurosis of sudden occurrence. Hemorrhage under the sheath of the optic nerve is the occasional cause of amaurosis, and, when the latter is double, fracture of both optic foramina extending across the pituitary fossa of the sphenoid bone must be admitted. It is probable that when the amaurosis is curable, it was the result of hemorrhage, intra-cranial or sub-vaginal.

CASE I.—J. A., native of Spain, for five years a resident of Havana, came to my clinic on the 19th February, 1876, at which time he was 47 years old, of good constitution, and stated that he had never been sick except once with smallpox. There was no sight in the right eye, which apparently did not differ in appearance from the left, and the latter had never given him any trouble. The amaurosis of the right eye was of two years' standing, and the result of a fall from a wagon, striking on the superciliary region, which rendered him unconscious for thirty-six hours. He was taken to the hospital, and, on being discharged eight days afterwards, noticed the loss of sight in the right eye, which presented nothing unusual; and, as it occasioned no inconvenience, he had sought no advice.

Careful examination revealed complete absence of luminous perception in the right eye, while the ophthalmoscope showed integrity of the refractive media and atrophy of the optic nerve papilla, which lacked the normal reddish hue, and, deprived of its own vessels, presented a pearly white colour. The retinal vessels were contracted in their calibre, while the retina and choroid appeared normal.

The amaurosis from atrophy or degeneration of the optic nerve promised little or no hope of relief. The use of electricity and the administration of iodide of potassium were, however, recommended, but the patient was lost sight of two days afterwards, without my knowing whether the advice was followed or not.

CASE II.—Y. C., a Spaniard, æt. 21 years, cigar maker, and living in Cuba since 1872, came to my clinic in May, 1875, to obtain a certificate of disability for military service. On questioning him, with my suspicions aroused, he stated that when a child he fell, striking on the right temple, and from that time had been unable to see out of the right eye.

After examining him with the ophthalmoscope, I could certify to the existence of advanced atrophy of the right papilla, and the patient departed. In October, 1879, he again appeared, and, without making himself known or being recognized at first, was again entered on the register. The war being over, I suspected his statements might differ, and I questioned him anew. He now said that ten years before he received a blow, from a fall, on the outer third of the right orbital protuberance, and, as a consequence, lost the sight of the corresponding eye, which, some time afterwards, turned outwards slightly, both eyes since then suffering from the state of irritation noticeable at the time.

Examination revealed the existence of bilateral conjunctivitis, such as is observed in cigar makers,¹ slight hypermetropia, and asthenopia, due to his occupation and want of proper glasses, and divergent strabismus occasioned by the amaurosis, and atrophy of the papilla of the right optic nerve. The atrophy of the papilla was evident from its paleness, which made it appear like a piece of white paper, and from the absence of blood-vessels, and obliteration of its slight normal protuberance. The few retinal vessels observable were attenuated, and starting from the external border of the papilla, divided in two groups, which were distributed one to the superior and the other to the inferior portion of the retina. The state of the vessels and papilla excluded all probability of glaucomatous excavation of the optic nerve.

The treatment indicated by the conjunctivitis was advised, together with absence, at least temporarily, from work, and the use of proper glasses on resuming his employment.

CASE III.—S. N., æt. 37 years, a native of Havana, came to my clinic May 7, 1877. He complained of blindness of the left eye, and the ophthalmoscope revealed complete atrophy of the optic nerve papilla. With very little time at my disposal just then, one of my clinical assistants undertook to get the history of the case. The patient calling his attention to some ulcers and old scars on the right leg, which was also swollen, stated that he had a chancre five years previously, and the doctor, judging that syphilis might have something to do with the present trouble, prescribed specific treatment.

In February, 1880, he came again, complaining of irritation of the right eye, which he hurt on putting on his glasses the night before. The ophthalmoscope revealed nothing abnormal, the trouble being simply an ecchymosis of the ocular conjunctiva, from the cause mentioned. The posterior staphyloma and use of concave lenses led me to diagnosticate myopia of both eyes. The left was turned outward, and, with the ophthalmoscope, advanced atrophy of the papilla was detected. The sight was entirely gone, and the patient's anxiety was only in regard to the other eye. The whitish discoloration of the papilla and contraction of the retinal vessels, awakened the suspicion of old atrophy, and, on asking him whether he had ever received a blow, and if so, where, he answered in the affirmative, and pointed out two scars, one on the internal extremity of the left supra-orbital ridge, presenting a depression through the whole

¹ Hygiene de la Vista, 1879, p. 63.

thickness of the scalp, and the other about the middle of the right eyebrow, longer and deeper than the first, and indicating the infliction of an incised wound. In explanation, he stated having received a blow from the butt of a musket over the left eye and a sabre cut over the right during a riot. He was taken to the hospital; both lids swelled greatly, and, on the third day, on lighting a match, found that he could not see with the right eye.

The measures indicated by the conjunctival trouble were prescribed, and not until this very day, while looking over my notes, have I discovered that this was the same patient examined by my assistant in March, 1877. The diagnosis was in both instances the same; but until now the etiology of the case was not correctly settled.

CASE IV.—J. A., of Madrid, Spain, æt. 31 years, and good constitution, was thrown from a carriage, twenty days ago, striking the whole right side of the face, and remaining unconscious through the night and following morning. He vomited some; was bled from the arm, and had mustard applied to the feet. After regaining consciousness, he complained of pain and constriction on the whole right side of the head, with difficulty of mastication, and aching in the bones of the face. There was ecchymosis of the lids and hyperæmia of the ocular conjunctiva. At present (October 15, 1876), it pains him to bite the end of a cigar with the incisors.

Simple ocular inspection of the eyes reveals nothing abnormal, but over the external third of the right eyebrow a recent scar, covering about a square decimetre, and apparently the result of a contused wound, is to be seen.

There is diminution of sight in the right eye, shown by his inability to read Snellen's test types No. 15, and the ophthalmoscope demonstrated the existence of myopia (already suspected); posterior staphyloma of both eyes, and incipient atrophy of the right papilla, which appears pale and with few bloodvessels; the retinal vessels as well as the bottom of the eye presented nothing new.

Iodide of potassium in gradually increased doses, and muriate of ammonia and iodide of lead ointment to the forehead were prescribed, and the patient lost sight of.

CASE V.—Mrs. A. B., æt. 60 years, a native of Havana, came to the clinic May 8th, 1880. She was extremely thin, and suffering then from a transitory attack of diarrhœa; a careful examination by Drs. Madan and De la Puente revealed a sound organism.

She says that eight days ago she fell from a broken chair, striking her face on a stone near by, and injuring the external inferior portion of the right orbital arch near the temple. At first the pain was not severe, nor was there any change in the parts until the next day, when the right eye became as inflamed as it now appears. Later on there was intense pain, epiphora, tumefaction of the upper lid with ptosis, and loss of sight. Compresses wet with tincture of arnica were applied at the time of the accident. When I examined her no evidences of the lesion were perceptible about the orbital region.

The left eye appeared sunken in the orbit, while the right seemed on a level with the face; and, the position of the left being normal, it was evident that the right was the seat of pronounced exophthalmia: the globe was immovable; the ptosis and epiphora remained; the lid was thickened and purple, and lifting it carefully the conjunctiva could be seen injected,

and slight peri-keratitic chemosis. There was loss of sight and very little perception of light. A slight mydriasis obtained, the ophthalmoscope brought into view the fundus of the eye through a slight cloudiness, and the papilla although discoloured did not show the blanched appearance of atrophy; there was no glaucomatous excavation; the retinal vessels were attenuated and the rest of the ocular fundus slightly pale.

The treatment consisted in the internal administration of iodide of potassium, and iodine locally to the forehead, temple, and upper lid.

Two days after, the palpebral tumefaction was somewhat better, and slight movements of the eye could be detected; the condition of the interior was unchanged, but she had been comfortable for two nights, and said that the eye seemed devoid of sensibility. After two more days her symptoms remained about the same, and although she declared she could see better, she could not count the fingers. Complained of itching at the seat of lesion and the inferior portion of the palpebral conjunctiva tended to prolapse through the palpebral opening. The treatment was continued but the patient never presented herself again.

With a view to the settlement of the question under consideration, in so far as the lower animals are concerned, I have experimented on twenty-seven dogs as follows.

In the first group I divided subcutaneously and to the bone, the tissues at the internal and external extremities of the supra-orbital arch, using Petit's knife and cutting from right to left, and *vice versa*, as in neurotomy of the frontal branches. The wounds healed in twenty-four hours, and thirty days thereafter vision was still perfect on the side operated upon. To determine this the lids of the other eye were closed by sutures in all the dogs subjected to this series of experiments.

In the second group the integuments were divided along the supra-orbital border, in the region which would more approximately correspond to the superciliary in man, and the bone exposed, the periosteum was cut so as to insure the division of the frontal nerves. The wounds were closed by sutures and soon healed, the result as to loss of sight being negative. The third and fourth series were subjected to cuts more or less deep by striking the exposed bone on the same region with a razor, but no alteration of sight followed.

Another group suffered contusions on the same place, one of the dogs being instantaneously killed. The others were temporarily stunned, but none had lost vision on the affected side thirty days afterwards.

In the sixth series trephining was practised, and water forcibly injected into the interior of the cranium with a syringe nine centimetres long by two in circumference. The first dog received the entire contents of the syringe and fell in a violent convulsion, which was immediately followed by absolute general rigidity, alternating with clonic spasms of the extremities, which lasted six days, and terminated in death by asthenia. The other dogs did not receive a full injection, and only suffered from the immediate convulsion, which, however, was in every instance shorter and less severe than in the first. In none did blindness supervene.

In the last group a bony plate was detached in the same region, so as to expose the dura mater, which was not injured. Some hemorrhage followed the operation, but no amaurosis. In none of the dogs experimented upon were cicatricial adhesions observed between the skin and periosteum, nor did suppuration occur in any. Wherever the skin was divided, metallic sutures were employed to hold the lips of the wound in apposition.

The following conclusions may be deduced from the foregoing:—

1. Amaurosis following wounds of the eyebrow is generally the result of cerebral lesions, as proved by the fact that in the greater number of cases the patient loses consciousness or dies soon after the accident.

2. Although modern ophthalmological literature does not contain a single instance, followed up from beginning to end by ophthalmoscopic examinations, two of my cases, and Galezowski's observations go to show that amaurosis is due to atrophy of the papilla, and this to a cerebral lesion of more or less severity, or to injury of the optic nerve in its passage through the optic foramen.

3. Those cases where the amaurosis is attributed to sympathetic action or excitability of the fifth pair of nerves, from whatever cause, occurred previous to the employment of the ophthalmoscope, and were open to erroneous interpretations.

4. The amaurosis occasioned by simple irritation of the supra-orbital nerve, from punctures, cicatricial distension, or any other cause, might at the present time be doubted in the absence of a single complete clinical record to support it; but, inasmuch as sympathetic amaurosis from excitability of the maxillary branch of the fifth has been observed, the possibility of a similar result as regards the supra-orbital, one of the three principal branches of the trigeminus cannot consistently be denied.

5. The entire identity between amaurosis from irritation of the superior maxillary and supra-orbital nerves once conceded, the prognosis must be considered equally favourable in either case; for amaurosis from wounds of the eyebrow resulting in atrophy of the papilla is incurable.

6. The experiments on dogs inflicting divers traumatic lesions on the supra-orbital region have not been followed by amaurosis.

HAVANA, Cuba, October, 1880.

ARTICLE V.

THE CAUSES AND TREATMENT OF METRORRHAGIA AND MENORRHAGIA,
By RUDOLF TAUSZKY, M.D., Attending Physician and Surgeon to the Mount Sinai Hospital, Out-door Department (Gynæcological Diseases of Women).¹

THE subject of this paper embraces the treatment, and the direct as well as some of the remote causes of metrorrhagia and menorrhagia as they

¹ Read before the Obstetric Section of the New York Academy of Medicine, June 24, 1880.

occur in the practice of the gynecologist. The following observations are based upon the study of 98 cases of alarming uterine hemorrhage (in menstruating women) which I have attended within the past two years, and propose to consider under the following propositions:—

1. What are the known pathological conditions of the uterus and its appendages, giving rise to excessive uterine hemorrhages and hyperæmic conditions of the same?

2. Are we always able, with the means at our command, in the present state of our science, to check uterine hemorrhages?

3. Is the practice of treating women suffering from uterine chronic hyperæmia, menorrhagia or metrorrhagia during the inter-menstrual period only, a correct one, and the best method to be pursued, or is it not more rational to treat them shortly before, during, and immediately after menstruation as well as during the inter-menstrual period?

4. What is our practical experience regarding the value of Emmet's trachelorrhaphy as a curative agent for chronic menorrhagia and metrorrhagia?

5. What is the value of the curette, first introduced by Recamier in 1850, for the removal of fungosities of the uterine mucosa, and consequent excessive uterine hemorrhage; and is the dull wire curette of Dr. T. Gailard Thomas not a far safer instrument to be used for menorrhagia and metrorrhagia?

6. What is our experience and that of others regarding the value of hot-water injections as a uterine depleting measure and hemostatic?

7. Is the intra-uterine use of the solutions of iron (like Monsell's, half diluted) a safe and justifiable procedure or not in the treatment of some of the affections under consideration, if applied with the necessary precautions, and according to established and now well-understood scientific principles?

8. What are the symptoms of chronic menorrhagic menstrual endometritis (as described by A. Schott, in Volkmann's "Clinical Lectures," No. 161) which I found to be present in thirty of the cases which I have attended for metrorrhagia that had lasted from one to three years?

In answer to the first question, I will enumerate the causes of metrorrhagia and chronic uterine hyperæmia as we find them mentioned in the text-books, with several additions which I have ascertained, but of which no mention is made in publications with which I am familiar. These are the following: Pelvic peri-uterine or retro-uterine hœmatocele, extra-uterine pregnancy, oöphoritis, salpingitis, peritonitis, cystitis, perimetritis, and parametritis, metritis or endometritis; versions or flexions of the womb, especially latero-flexions; atony and subinvolution of the uterus; new formations within or around the uterus; large abdominal tumors, compressing the uterus itself or the ascending vena cava, or its branches; extensive laceration of the uterus or its cervix; granulations, erosions, ulcerations,

or fungosities; cystic degeneration of the cervix; mucous and fibrous polypi; inversion of the uterus; retained portions of the placenta or the ovum; chronic pelvic or uterine congestion caused by thinness and narrowness of the bloodvessels; chlorosis menorrhagica (Virchow); general circulatory disturbances; chronic diseases of the lungs, the heart, the liver, the kidneys; faulty development of the genital organs, or of their bloodvessels; hemophilia; chronic disturbances of the whole or a part of the digestive and nervous apparatus; habitual abortions from syphilis, fatty placenta, etc.; traumatic causes; extensive uterine adhesions; gonorrhœa in the husband; uterine infection caused by the introduction of unclean instruments, by the fingers of physicians or nurses, or self-infection; acute exanthemata, typhus fever, cholera, lead or phosphorus poisons; movable kidney, syphilis, purpura hemorrhagica, scurvy; unsatisfied sexual desire in women who are considerably younger than their husbands; exhausting mental or physical overwork; insufficient food supply; too tight lacing; neglected, habitual constipation; grief; disappointments; want of proper rest; exposure to a chilly or impure atmosphere; imprudent behaviour during menstruation; too frequent unobserved proximity and illegitimate familiarity of the young female with the male; too frequent visits, of especially unmarried women, to balls, parties, theatres, and other public places of amusement; the reading of obscene literature; too early rising out of bed after abortion or child-birth at full term; too frequent coitus; masturbation.

In some of my cases, upon the closest bimanual and intra-uterine examination, there could be found nothing pathological to account for the hemorrhage, and still the patients—some of them married and mothers of one or more children, others married, but sterile, a few unmarried and innocent—who consulted me for uterine hemorrhage, stated that they bled from two to three times, some oftener, within a month, losing considerable quantities of blood each time; the flow lasting longer than at their normal periods, and they suffered also from quite profuse leucorrhœa, often tinged with blood.

The sufferers were, of course, usually anæmic, they complained of frequent headaches, loss of appetite, general weakness, irritable bladder, and not unfrequently of nausea, and pain in the epigastric and hypogastric or the iliac regions. They felt very nervous, peevish, and irritable. At times their courses would stop for a couple of months, when an abortion would follow in some cases, and the frequent and irregular bleeding would recur again as before. The bowels were usually sluggish and constipated; sleep was often disturbed and unrefreshing. Careful bimanual and intra-uterine examination taught me in some of these patients that the profuse flow of blood from the uterus was due to an excessive hyperæmic condition of the pelvic organs, especially of the endometrium, which was found to be soft, flabby, swollen, much thickened; the uterine probe or sound glided

over it, especially at the os internum, as if meeting with a resistance, and when passed into the cavity of the body it became quite painful, especially when touching the fundus uteri. Upon withdrawal some drops of blood were observed upon it, a slight flow from the endometrium following it.

In the text-books on gynecology these cases are described as suffering from pelvic congestion and endometritis, and the treatment usually recommended is rest in the recumbent posture, with the foot of the bed elevated, laxatives, the local abstraction of blood, the hot vaginal douche, narcotics for the relief of pain, and intra-uterine medication with tincture of iodine, Churchill's solution, or carbolic acid ℥ss to 3j of glycerine, or nitrate of silver 10 to 20 grs. to the ounce of distilled water; in obstinate cases nitric acid is recommended to be applied to the endometrium once or twice a week during the inter-menstrual period; and the rule is generally followed in these cases to abstain from all medication during the time of menstruation, with the exception, perhaps, of relieving pain by narcotics, and of giving to the patient 10 to 15 drops of the elixir acidi Halleri, largely diluted in water, if the menorrhagia is very profuse. I will, *en passant*, mention here that in the cases of endometritis menorrhagica chronica, in accordance with Dr. Schott's advice (*loc. cit.*), I have followed the practice successfully of treating such women shortly before, during, and immediately after menstruation in the manner which I will describe further on.

The second proposition I answer in the affirmative. We are almost always able, as far as my experience goes, to arrest any uterine hemorrhage we are called upon to treat in our gynecological practice by the use of the intra-uterine tampon, and the application of the solutions of iron to the bleeding endometrium after emptying the uterus of clots, polypi, retained portions of placenta or of the ovum, the removal of papillary growths, granulations, or fungosities by means of Thomas's dull wire curette, or by the introduction of the hot iron in desperate cases—Paquelin's thermocautery, for instance. Only in one case, seen by me after miscarriage (5th month), having been tired out by overwork that day, did I fail to remove some portion of placenta, but my colleague, Dr. Mundé, whom I called to my assistance, removed it, however, for me, with the result of checking the hemorrhage. The woman fully recovered.

As it is not my purpose to consider the treatment of placenta prævia, post-partum hemorrhage, or that occurring from threatened abortion, or uterine bleedings coming within the domain of the obstetrician, I should not have mentioned this case had it not occurred immediately after an abortion at four and a half months, in a woman who had bled to a frightful extent for several weeks before I saw her, and yet even in this desperate case the hemorrhage was checked by the application of Monsell's solution, after the uterus had been thoroughly emptied. I have never seen any evil results follow its application in at least fifty cases of profuse uterine hemorrhage in which I have applied the solutions of iron intra-uterum. I never use

it, of course, unless the uterine cavity be fully dilated, which I consider a safe rule in making any intra-uterine application. After dilating with laminaria or tupelo, never with a sponge tent, and medicating the cavity with an ointment of alum, 3-4 grs. to each application, or with bougies made of tannic acid and gum tragacanth, I never hesitate for one moment, if these measures fail, to apply the solutions of iron, concerning the use of which I have seen recently in the "Transactions of the American Gynecological Society" fears expressed that I do not think need ever be entertained if the remedy be used by skilful hands.

During excessive menstruation, or shortly before it, I place my patients in bed with their hips elevated, not the foot of the bed—as recommended in our text-books. I also rely greatly in robust individuals on salicylate of soda administered internally, or per rectum, if there is an elevation of temperature, or I abstract blood locally by scarifying the endometrium; I administer digitalis in large doses if the heart's action is found to be irregular, instead of the salicylate—hot vaginal douches I continue until the bleeding stops, and advise the patients to use ergotine either internally, or I give it hypodermically—even during, shortly before, or immediately after the menses have ceased. In severe pelvic congestions I continue this treatment even during the inter-menstrual period, although giving the medicines in lessened doses. Where I want a more decided contraction of the uterine and peri-uterine bloodvessels, I also use, once a week, cauterizations of the endometrium, with either Churchill's solution of iodine or the carbolic acid solutions used in the New York Woman's Hospital for endometritis chronica, but only one week before and after the usual time of menstruation. Tonics are, of course, not omitted in those cases needing them, and gentle laxatives and enforcement of hygienic rules are the *sine qua non*.

Among other tonic agents I have found none superior to the cold sponge bath, which is an excellent nerve tonic and stimulant. The temperature of the body can be lowered by this means from 1 to 2 degrees Fahr. Preferably to the cold sponging I employ occasionally the rubbing of the patient with the coarse, wet, cold towel, or the wet sheet, dipped in water of a temperature ranging from 62° to 52° F., well wrung out and wrapped around the patient tightly; before I apply the latter, I cool the head by cold applications so as to prevent a sudden congestion of the brain, which would otherwise follow. The friction bath is a powerful nerve stimulant, since the terminations of the peripheric nerves are thus stimulated the very moment of their contact with the sheet. This method causes a dilatation of the peripheric bloodvessels, thereby relieving congestion and hyperæmia of internal organs, and such complaints as cephalalgia, gastralgia, enteralgia are thereby often relieved. We can continue the use of the sheet one or more hours if necessary, until the temperature is considerably reduced (to the normal standard); to prevent the sheet

from becoming dry we pour more water upon it from time to time. Colder portions of the body are to be rubbed until they get warm, the hands and feet for instance. Painful parts are covered with wet cloths, in addition to the sheet, of course a rubber sheet is always necessary, so as to prevent the chair, sofa, or bed occupied by the patient during the bath from getting wet.

There is one rule which I desire especially to mention, as of the utmost importance in administering cold baths, or even cold applications to any part of the body, viz., the skin must become red, never bluish or pale. The patient should never feel chilly while in the wet sheet. If this happens, I have her well rubbed all over until she gets warm, or I remove the sheet and give some hot drink, tea, coffee, or warm milk and brandy, and let her go to bed at once, so as to get thoroughly warmed through. By these and similar means, I usually succeed in relieving menorrhagiæ and metrorrhagiæ that have resisted treatment often for several years.

I desire now to direct attention to the consideration of the physical symptoms of chronic menorrhagic endometritis as a cause of metrorrhagia. In the cases thus affected, the mucous membrane—the endometrium—attains a thickness of five millimetres and more, normally it measures but two or three mm. Here we have a condition precisely similar to that which occurs at every normal menstruation. This important function has been recently carefully studied by Kundrat of Gratz, and Engelmann of St. Louis, Williams of London, and Gerhard Leopold of Leipzig. (See the *American Journal of Obstetrics*, May, 1875, and April, 1878, “The Mucous Membrane of the Uterus during Menstruation.”) In order to substantiate that this “endometritis menstrualis” is simply an exaggerated normal menstruation, as stated by A. Schott, and fully verified by myself after a careful study of the subject, I will quote what the observers mentioned have found to take place on the uterine mucosa during normal menstruation, and I think that it will be at once seen that the two processes are almost entirely identical. The changes taking place are the following, according to Leopold:—

“The mucous membrane hypertrophies as the time of the menstrual flow approaches, from a thickness of 2–3 mm. in the inter-menstrual periods, it attains that of 6 or 7 mm. at the appearance of the flow, gradually decreasing during its continuance, until at the end of the period the mucosa is found void of its superficial layer—but within a day or two again appearing in its normal inter-menstrual condition with the thickness of 2–3 mm., the glands of the menstrual membrane are no longer narrow and straight as in the membrane at rest. They have become enlarged and tortuous in their course, with marked sinuosities, especially the central layers; the inter-glandular tissue consists of short fusiform, so-called, cells, with large nuclei, which are found in a condition of active reproduction in the lower layers in contact with the muscular tissue. Characteristic are the young cells which pervade the entire tissue as well as the blood-corpuscles which are found in the uppermost layers, closely surrounding the engorged vessels, and rarely extending into the membrane as far as the middle layers. In marked contrast to the frequency of the enlarged capillaries and arteries in the uppermost layers of the mucosa is the scarcity of veins, which appear but here and there,

running in a direct course toward the muscularis. Leopold further asserts that for several days an extravasation of red and colourless blood-corpuscles takes place from the enlarged and superficial capillaries into the surrounding tissues, especially toward the surface of the mucosa; the uppermost layer of cells is undermined and separated from the underlying layers. A copious layer of blood reaches the superficial capillaries through the numerous arteries, although it arrives but slowly on account of the tortuosity of the vessels—its progress is checked by the enormous dilatation of the capillaries, and the scarcity of the returning veins; hence the rupture of the distended capillaries and the escape of blood through the uterine cavity into the vagina. Regeneration takes place by the absorption of the remaining extravasated blood-corpuscles, reproduction of inter-glandular tissue, and covering of the new-formed surface by an upward growth of cylindrical epithelium, lining the glands. From the eighteenth day on, the mucosa again begins to hypertrophy, the vessels diminish in size, but the glands lengthen and become more sinuous, the entire tissue more soft and lax. Thus this membrane is in a condition of a constant change."

Leopold contradicts the statement of Kundrat and Engelmann that the superficial layers of the mucosa undergo a fatty change and are being thus shed or desquamated at each menstrual period. My own microscopic examinations convinced me that the statements of Kundrat and Engelmann are fully correct, and that we find in every menstrual fluid epithelia which have undergone fatty changes. I have referred to this subject already in my publication "On the Anomalies of Menstruation," *N. Y. Physician and Pharmacist*, Oct. 1879. The uterine blood-pressure constantly changes during the menstrual years from puberty to the climacteric, especially in child-bearing women. If this uterine pressure is materially increased some of the over-loaded and distended superficial bloodvessels, the capillaries, have to give away and excessive menstruation gives rise naturally to anæmia, to nervous symptoms, and, if lasting for some time, makes the sufferers morose and peevish, dissatisfied with themselves and the world. The courses, says Schott, return twice or oftener a month, and continue for eight or ten days. We examine such women, and we find, perhaps, a cause for the bleedings, for instance a polypus, enlarged Nabothian follicles, bleeding granulations or ulcerations, but in the majority of cases we find nothing; the cervix is in a healthy condition. We use a laminaria or tupelo tent, we examine for fibrous polypi which we thought we could feel bimanually, but the most careful examination of the uterine cavity gives at first a negative result, except that we find an unusual softness and an easier mobility of the uterine mucosa. We also encounter small protuberances which prove to be folds, not outgrowths, of the endometrium, which disappear. And we find, by bimanual palpation, a considerable enlargement of such uteri.

These are cases in which we have a pathological excess of the menstrual swelling and a hyperæmia of the uterine mucosa. If we examine such women immediately after menstruation, the cavity of the womb still appears spacious, and it is somewhat longer and the body a little enlarged and swollen. At the next period we find the uterus still larger, the disproportion between the body and the neck becomes more and more apparent, and

the uterus feels like a pedunculated tumour; the heavy, large uterus resting upon a relatively thin and long cervix, tips over, and we have the picture of a decided flexion before us—ordinarily an ante flexion.

The swelling of the mucosa, as is known, occurs during normal menstruation, principally within the cavity of the uterus and the Fallopian tubes; we find it therefore swollen at the internal os, considerably and abruptly elevated. The sound encounters in the cavity of the body the thickened mucous membrane, and cannot be passed as easily as in the cervix. The normal texture of the endometrium is not changed in these cases, only the damaging influences, some of which I have mentioned, cause circulatory troubles and an increased hyperæmia in the uterine blood-vessels and finally frequent ruptures with metrorrhagia and menorrhagia resulting. I have, therefore, dwelt upon it at some length, and I must here state that if we understand the causation of these affections the battle is half won when we are called upon to treat them. These chronic congestions may give rise by and by to inflammatory processes of the sexual organs, to the growth of polypi, or of sarcomata, fibromata, myomata, cysts, and even, perhaps, if persisting for years, to carcinomata or rodent ulcerations from mal- and over-nutrition, excessive blood-pressure, and emigration of colourless blood-corpuscles, the formation of juvenile medullary or embryonal tissue.

My researches and histological studies on the epithelial changes occurring during the growth of sarcomatous tumours, published by the Vienna Academy of Sciences, in vol. lxxiii., 3d division, January, 1876, have shown that connective tissue growths may originate in glandular structures, and that epithelia may by division and proliferation give rise to the formation of connective tissue new formations, like sarcomata. Each granule within the epithelium and each connecting link between the granules of the living matter of the protoplasma, within the epithelia—C. Heitzmann's threads and Max Schulze's thorns—may by their increase and growth develop under favourable circumstances into connective tissue formations. If the living matter assumes the fibrous structure we have the fibroma, if the arrangement is that of muscle we have a myoma, if the corpuscles remain in the embryonal condition, multiply and proliferate rapidly, and assume the malignant character we have the sarcoma, formerly termed encephaloid; and if it assume the alveolar structure with gland ducts we have the adenoma, and if within the alveoli no ducts are present we have the carcinoma. In the latter case the granules—the threads, and the thorns—are often transformed into epithelia forming alveoli without ducts. Recently Cohnheim stated that the fibroids of the uterus originate from a surplus of germ vesicles (Keimbläschen), pre-existing in excess to the number necessary for the construction of the normal tissue, but this excellent observer simply gives an opinion, an hypothesis, unsupported by facts, while my own investigations closely show the connection between

the causes and the effects of chronic hyperæmic conditions and new formations of tissue eventuating in new growths.

Professor Otto Frankenberg, of Starling Medical College, Columbus, Ohio, has translated my article published in Vienna, into English, in the *Ohio Medical and Surgical Journal*, 1877. I have adduced these studies of mine regarding the formation of neoplasmata with special reference to the female reproductive organs in order to prove the close connection existing between chronic hyperæmic conditions and their development and consequent metrorrhagia. The bleeding coming either from the tumour itself if it ulcerates and some portion of the same containing bloodvessels becomes eroded, or if it, by its bulk, prevents the uterus from fully contracting, and thus leaves openings in ruptured bloodvessels. For this reason we find the subperitoneal fibromata or myomata give rise to uterine hemorrhages less frequently than those of the interstitial or of the submucous variety.

What is our experience regarding the value of trachelorrhaphy as a curative agent for menorrhagia and metrorrhagia? In answer to this question I may state that I have seen uterine versions, cystic degeneration of the cervix, endometritis, subinvolution of the uterus with frequent metrorrhagia relieved, after having faithfully used the preparatory treatment insisted upon as essential to success in lacerations of the cervix uteri, according to the method recommended by Dr. Emmet, in a paper read by him before the N. Y. County Medical Society in 1876. This operation is still thought to be unnecessary by many able gynæcologists. In the interest of science and truth I must state that from what I have seen of the results of this simple operation it is a capital procedure if the laceration be excessive and cannot be cured by curetting the endometrium, by using Churchill's tincture of iodine to the endometrium and to the cervix after opening the enlarged Nabothian follicles, and by using a gallon of hot water twice daily in the vagina for some time, and by not operating until all sensitiveness in or about the uterus has been entirely relieved.

The paring of the cervix unloads many of the distended veins, and cures the ectropium if present, and also acts beneficially upon the endometritis and subinvolution usually present in these cases. If there is prolapse, of course a properly adjusted pessary will be necessary for the patient even after the operation. Smaller lacerations I have often cured by the use of iodoform and tannin applied twice a week, and tannin and glycerine tampons applied daily, one in front and one behind the cervix, and by using laxatives, tonics when required, and the hot douche. I have seen patients relieved permanently by the operation of trachelorrhaphy who had been treated unsuccessfully for many years.

I come now to the consideration of the value of the curette in the treatment of fungous, granular, and polypous endometritis, and I touch upon this curative agent for the reason that at the last meeting of the American

Medical Association, many gynæcologists denounced the instrument as barbarous, and as doing more harm than good. My colleague at the Mt. Sinai Hospital, Dr. Mundé, two years since, wrote an able paper on the silver wire curette, in which he reports twenty-five cases of metrorrhagia cured permanently by him by this curette, devised by Récamier in 1850, and recently modified by Dr. T. Gaillard Thomas. He justly condemns Sims's, Simon's, or Récamier's curette as dangerous when used against small polypi, fungosities, or granulations within the cervical or uterine cavity. I can corroborate, after two years' further large experience in my hands, the high value Dr. Mundé places upon Thomas's curette. In thirteen of his cases he removed remnants of placenta or membranes; in ten there were fungous growths, the so-called endometritis chronica hyperplastica of Ohlshausen, who a few years ago gave an excellent description of this troublesome affection. The use of the curette or of Thomas's serrated scoop is the best means of checking uterine hemorrhage when there is anything abnormal within the uterine cavity, including removable foreign growths, that cause uterine hemorrhages. I use the curette almost daily in my office and in the dispensary, and I have never seen anything but good follow its use in my hands. I learned to use a similar instrument in 1873, while I was in Vienna, for the removal of adenoid growths from the posterior nares, and I mention it here incidentally as an evidence of its high value in any locality for the safe removal of unhealthy tissue. I also saw it used by Hebra in cases of epithelioma of the nose and of other parts of the body. Everywhere it was used to advantage, and especially as a ready means of arresting uterine hemorrhage, as detailed fully in Dr. Mundé's paper.

What is our experience with hot water injections as a uterine hæmostatic? In atony of the uterus, as recommended by Trousseau of Paris in 1853, I have used hot water injections, per vaginam, of a temperature of from 110° to 120° F., with the most remarkable results. This is a most efficient method of checking profuse uterine hemorrhages, even in ulcerations from carcinoma or rodent ulcer. I have used them with one or two teaspoonfuls of liquor ferri sesquichloridi to the quart of water with benefit. Although hot water injections had been recommended twenty-seven years ago for uterine bleedings, they were soon forgotten and not thought of until Dr. Emmet, a few years since, re-introduced their use, and secured for them a permanent place in our therapeutic resources in the treatment of uterine hemorrhages. It will, perhaps, be advantageous to compare the reports from practitioners abroad who have used it extensively for that purpose with our own in this country. I will briefly state I could not do without them, so efficient have they proved in my hands. How they act has been explained by Dr. William Schlesinger of Vienna, in the *Vienna Medizinische Blätter*, of which he is the editor.

"A few years ago, the first news of this procedure reached us from across the Atlantic. At that time it was hardly deemed worthy of notice. So greatly

was it mistrusted, that the proposition even to-day awaits a trial in many of our clinics. It was forgotten that no less an observer than Trousseau recommended this method over twenty years ago, *Gazette des Hôp.*, No. 33, March 19, 1853, pointing it out as the surest means of arresting hemorrhages, menorrhagia, and metrorrhagia. Trousseau even endeavoured to offer an explanation for its physiological effect by a simple experiment. If one hand is placed in water at 40° R., the other in water at the freezing point, the cooled hand feels warmer, the other cold. Trousseau's proposition came to us as something new a few years ago, as proposed by Emmet. This new method was given a fair trial by Windelband, *Deutsche Med. Wochenschrift*, 1876, who used hot water injections in all uterine hemorrhages, and highly recommends it—having found it efficient in metrorrhagia after abortion, after premature delivery, and after parturition at full term; in bleedings caused by distension of the uterus, or chronic inflammations, or in metrorrhagia from uterine fibroids; so, also, in metrorrhagia occasioned by carcinoma. Windelbaum begins with water of 38° R., and elevates its temperature gradually to 41° R., and he ascribes its effect to the direct influence of the heat upon the muscular fibres of the uterus. That the hot water causes coagulation of the blood and thrombi, he has not seen.

“Similar to these favourable results is the experience of Jakesch in Prague, *Prager Wochenschrift*, No. 41, 1876, and Landau, *Breslauer Klinik*. Jakesch reports twenty-two cases in which he applied hot water, only two cases failed. In the first the water used was too cool, only 38° R., and in the second there was a puerperal infection, in consequence of which the patient died. Hot water produces contractions of the uterus; this was proved by Schlesinger, who introduced his finger near the internal os, and directed the hot water towards the uterus, which he felt immediately contracting violently. Runge, *Berlin. Klinische Wochenschrift*, 1877, No. 13, has applied the method in twenty-two cases; ten were atonies of the uterus post-partum, seven bleedings after abortion with retention of portions of the placenta, five in metrorrhagiæ caused by neoplasms. He states if there are portions of placenta retained, or blood coagula, the application is useless; so, also, in cases of new formations the effect is only temporary, of course. In three cases of atony of the uterus he had no good results, in all the others he succeeded in checking the hemorrhage. The author lauds another good effect of hot water injections on the constitution of the patient, since the bloodless and cold-blooded patient becomes warm thereby. Peter and Guéneau de Mussy also speak in its favour, *Journal de Méd. et de Chirurg.*, vol. 48, March, p. 107, and *Gazette des Hôp.*, No. 136, 20 Nov. 1875. Rubber bags filled with hot water and applied to the loins and the spine, and hot baths of 2-3 minutes duration answer the same purpose.

“The latest report on this subject comes from the Charité in Berlin, from Dr. Fassbender (The Irrigation of the Uterine Cavity with Warm Water, 40° R., in Childbed Bleedings, by Carl Richter, *Zeitschrift f. Geb. und Gynæcologie*, 1878, vol. ii. p. 284, 2d part). Hot water injection of the uterine cavity is at present the only method applied in the Charité beside the administration of from 2-5 grms. of secale cornut. *pro die* in alarming uterine hemorrhages, and has never yet failed in a single instance, although in a few cases the bleeding returned again. Richter's observation extends over a period of ten months. The injections were applied in 112 different bleedings, 105 of the patients were puerperal cases; 2-3000 grms., 90 ounces, of water sufficed generally. The principal effect is produced not by the direct contact of the water with the cervix uteri only, but by its reaching also the bleeding intra-uterine cavity, which it washes out. He accounts in this way for the excellent results obtained in Berlin. The heat of the one per cent. solution of carbolic acid used is always measured by the thermometer.

“The water is poured into the irrigator at a temperature of 40.5° R., and reaches the uterus with one of 39.5° R. to 40° . This temperature is the limit at which it is possible to move a not unusually hardened hand for some time to and fro, without scalding—although the burning is well felt, a half degree more could hardly be tolerated. Below 38° R. the injections were useless. If they are kept within the limits of 38° to 40.5° R. the patients complain a little at first, but then they stand it well. Even in recent perineal ruptures we went on with

the injections. Under all circumstances ascertain first, that there are no coagula in the uterus or vagina, because under these the bleeding might continue in spite of the hot water injections. It is the author's view that these injections act not only by causing contraction of the uterus, but he thinks the contact of hot water with the partly denuded inner wall of the uterus causes a slight inflammatory irritation, an oedematous transudation, and a swelling of the tissues, principally the sub-mucous inter-muscular and peri-vascular connective tissue, by which the blood-vessels become compressed, and their lumina are thereby occluded."

Dr. Schott says:—

"Excellent, and, according to my experience, innocuous in the treatment of menorrhagia and chronic hyperæmia of the body of the uterus are the results obtained by the use of hot water injections; they stop pain and check bleedings instantaneously if we use hot water injections of the proper temperature; they must be in most cases of 40 to 41 degrees Reaumur=122 Fahrenheit. The injection is to be continued until the pain and the bleeding stop. If they return, renew the injection. But I deem it a good precaution to stop every fifteen or thirty seconds, and then inject again, in order to allow the circulation again to cool the heated parts. That we succeed, he says, we can convince ourselves by the thermometer immediately after such an injection, which will show an elevation of a few tenths of a degree only. If we inject uninterruptedly we not only run the risk of lessening the contrast between the hot water and the parts, upon which the whole irritation depends, but we are apt to produce thereby a relaxation and paralysis of the parts, as proved by Max Runge on the human female and upon rabbits. Heat and cold act here entirely alike upon the irritable substances. Contractions of the uterus and of its bloodvessels are its results. We are often enabled to perceive the narrowing of the vagina based upon this contraction, produced by the hot douche. It is our aim by these means not only to cause the bloodvessels to contract, but also the uterine muscles."

Besides the hot douche, I have seen excellent results follow the use of quinia and of salicylate of soda in my practice in chronic hyperæmic conditions of the pelvic organs, as suggested by Schott, who says:—

"The best results were obtained in cases of menorrhagia and congestions of the pelvic organs by salicylate of soda. It acts as an antipyretic and antihemorrhagic remedy. It is highly beneficial, especially where there is congestion, swelling, pain, and slight elevation of temperature. Where it causes slight nausea, it can be given per rectum, by means of a long rectal tube. An elastic catheter (male) and a glass syringe are sufficient for the purpose, and the patients can use it themselves. From 15 to 30 grains of the remedy are administered for this purpose every hour, until the bleeding stops; if it returns, renew the dose. In obstinate cases large doses ought to be used. It causes ringing in the ears and temporary deafness. Only in affections of the heart is its use contraindicated. By this treatment menstruations that lasted 12 to 13 days, with great pain, ceased on the second day. My experience with this remedy extends over a period of several years."

The effect of salicylate of soda is shown by Moeli and Riegel to be the production of greater tension in the arteries of the surface, as proved by the sphygmograph in cases of fever. Bush and Strassburger have shown that during the use of quinia the radiation of heat of fever patients becomes increased, while the heat of internal organs is thereby lessened. The pale and cold skin becomes warmer, and consequently reddened, and also a greater secretion of the sweat-glands takes place. In short, these remedies act as narrowers of the bloodvessels. The antiphlogistic action of quinia and of salicylate of soda is proved as well as their antipyretic

effect clinically, as has been shown experimentally regarding quinia by Scharren, Croich, Martin, Zahn, and Appert; also that they check the emigration of colourless blood corpuscles. Their therapeutical value has also been shown to be, besides their antiphlogistic and antipyretic effect, that of checking secretions in catarrhal inflammations. Inflammatory and catarrhal secretions are processes that are very similar to the anomalies of menstruation, especially menorrhagia. When the uterus was largely swollen, I have seen it diminish in size under the use of salicylate of soda in large doses, so that if persisted in too long an atrophy and anæmia of the uterus might be feared; even in lying-in women not only the body of the uterus but the greatly swollen lips of the cervix become better by the swelling being greatly reduced in a few hours by the use of the salicylate of soda. This effect can be favourably compared to that of quinia in reducing the size of a swollen spleen. The salicylate of soda is to be used during the bleeding or the excessive menstruation.

What shall be done between the bleedings? Here we must seek the cause and study the external influences that cause or aggravate the flow. We must try to remove all causes which produce uterine or pelvic congestion, or which increase the general blood pressure. After each obstinate menstruation the patient ought to remain in bed two to three days in a horizontal posture, the same as after childbirth; the regeneration of the uterine mucosa ought to take place under the least possible blood pressure. Patients suffering from active or passive hemorrhages, accompanied by pain and some fever, indicating chronic metritis, should avoid exercise of any kind. Where there is a weakness in the uterine bloodvessels, even a long walk may be followed by serious consequences; but when the bleedings have been controlled for one or two weeks, walking seems to act as an excellent tonic, as shown by Nawrocky and Kochalewsky, who have demonstrated that muscular movements act as a tonic upon the whole circulatory system. But if by walking or other damaging influences the flow of blood and pain are increased, showing pelvic congestion, rest ought to be again enjoined, especially by elevating the pelvis, even the knee-elbow position may be useful in such cases. In this way we make an abstraction of blood without its evil consequences. In the same manner that ulcers of the leg heal by elevating the limb, so also chronic congestion of the uterus, by giving time to the newly formed small bloodvessels to attain strength in their walls to render them more fit to resist any pressure acting upon them. The patient should always, while walking about, wear a good bandage. A single piece of stiff cloth, fitting around the navel, tucked in at the hips, with eyes and hooks, or bands that can be snugly tied together, cut out at the ilium, with the insertion of a piece of elastic behind, furnishes the best and the cheapest abdominal bandage. If the uterus and pelvic organs are thus bandaged they are protected from jars and jerks and sudden movements, which, according to Golz, fill the uterus with

blood. This rule refers especially to horseback riding. All sexual excesses ought to be avoided. Coition should be interdicted; the following pain and congestion will probably aid in enforcing this prohibition. Many patients complain of cold feet and a cold sensation in the pelvic region towards evening. If this is permitted to continue, pelvic congestion follows, and causes a larger flow at the next period. To prevent this, warm clothing and early going to bed and good nourishing food and a general tonic, invigorating treatment are necessary. If the rectum is filled with feces or the bladder with urine, an impediment to the pelvic circulation is the consequence, and should be avoided. Rest, elevation of pelvis, poultices, hot injections, cold friction baths, with a coarse, so-called Turkish, towel, on going to bed. Ergotine, quinia, salicylic acid, either singly or in combination, are to be prescribed.

In obstinate cases the remedies and injections are to be used during the whole time intervening between the periods, even if given in small doses, and to be increased *during the period*, in very obstinate cases *several days before, during, and after menstruation*, with confinement to bed. We can thereby arrest even the growth of myomata, if we can prevent the greater afflux of blood to the pelvis, and the catamenial hyperæmia of the tumours, and thus deprive them of their nourishment. With ergotine, quinia, and salicylate of soda we accomplish this result against menstrual hyperæmiæ and metrorrhagiæ, with dietetic and hygienic measures, and the use of astringents during the period, partly intra-uterine (these, of course, in exceptionally desperate cases only) and partly intra-vaginal. These should also be continued between the periods. Cocoa-butter balls, with alum and tincture of iron, with glycerin tampons applied as high as possible should be used between the periods. After their application the vaginal mucosa comes away in larger or smaller shreds, after which we cease treatment for several days. Slight flexions that have existed for a long time become straightened by their use, simply by their tonic effect and that of reducing the swelling of the mucosa. When we want an absorbent action, in otherwise vigorous persons, we use balls of iodine or bromide of potash; these also cause a peeling off of the vaginal mucosa, and their effect is similar to that of alum.

Pencilling with iodine in the fornix, or externally over the epigastrium, acts like a blister of cantharides, and has a reflex irritative effect upon the bloodvessels. I employ this measure only if the patient be in a fair condition, but never when broken down. In the latter an invigorating, tonic treatment is of paramount importance. Mild abstraction of blood locally also acts well in some cases. Loss of elasticity in the capillaries, according to Ludwig, is a promoter of hyperæmia and inflammation; by emptying them temporarily of their contents they regain their normal elasticity, and by scarifying and drawing a small quantity of blood we prevent a metrorrhagia. Schröder prefers scarifying to leeches; punc-

turing the cervix, according to Spiegelberg, proves beneficial. Scarifications of the uterine mucosa, in the cavity of the body, are highly efficient, with a narrow, probe-pointed bistoury, making eight to ten superficial incisions, lengthwise, anteriorly, and posteriorly. The pain is scarcely felt after the knife is withdrawn.

Uterine colic, caused by retention of blood in the cavity, can be relieved by holding the os open a little while with Ellinger's or Palmer's dilator or with a polypus forceps. Congestive pains are thereby often immediately relieved. The cutting through of the dilated capillaries in the cavity of the uterus acts like the same procedure in the telangiectatic marks of the face; the cut vessels become obliterated and may be partly reproduced with a narrow lumen by restoration of their somewhat paralyzed walls. Baker Brown's recommendation to cut the capsule of intra-uterine myomata finds its scientific explanation, as to its antimenorrhagic effect, through the division of its dilated bloodvessels.

The scarifications, intra-uterine and of the cervix, when this latter swells through hyperæmia, explain the beneficial effect of many operations practised upon the neck of the womb and in cases of chronic inflammation. Where more is needed, we use intra-uterine escharotic cauterizations; these are very rational where there is also a catarrhal affection with hypersecretion. But we must bear in mind never to use intra-uterine caustic applications unless the internal os be easily permeable to the sound, and not to make too deep cauterizations for fear of producing perimetritis or parametritis.

Résumé.—In the treatment of menorrhagia, metrorrhagia, or chronic pelvic congestions and hyperæmic conditions, *rest*, with pelvis elevated, is of the highest importance. Hot water injections and scarifications of the cervix and endometrium I have found beneficial. Salicylate of soda, quinia, digitalis in large doses, and opium—for the relief of pain and where a nerve-sedative is indicated—are invaluable means of arresting uterine hemorrhages. Ergotin in large doses, given before, during, and after menstruation, every hour until the hemorrhage, if profuse, ceases, is one of our most valuable aids in arresting it. The use of intra-vaginal balls of the astringents, alum, tannin, and tincture of iron, preferably four grains of alum with a few drops of iron and glycerin, introduced every hour if the hemorrhage is alarming, or, still better, the careful intra-uterine application down to the fundus of tannin and glycerin upon a probe, or of Monsell's solution of the subsulphate of iron, half diluted with water, have in my hands checked uterine hemorrhages that have resisted treatment for months. I have never seen any ill-effects follow the intra-uterine application of iron in a large number of obstinate metrorrhagias in my own practice. Cauterizations in catarrhal endometritis, five or six days after the menstruation has ceased, repeated once a week, effected in my hands

the contraction of the enlarged womb and its bloodvessels, and cured the catarrh.

I repeat, that intra-uterine applications should never be used where there is an obstruction or a contraction at the internal os or any part of the cervical or uterine canal and cavity, and that flexions have to be straightened by the careful use of the sound, by the use of Thomas's anteflexion, or Graily Hewitt's cradle, or Gehrung's or Bozeman's new pessary, and, if adhesions be present, by Bozeman's method of tamponing the vagina, described by me for uterine displacements with adhesions and prolapsed ovary, in the *New York Hospital Gazette*, April 5, 1879. These tampons act by supporting the parts upon a gentle cushion of cotton, relieving thereby part of the hyperæmia of the uterine and ovarian bloodvessels.

In submucous and intermural fibroids, Hildebrandt's method of hypodermically injecting ergotine daily, often for months, has frequently checked long-continued metrorrhagia. In cases of carcinoma or rodent ulcer, fungosities, polypi, granulations, the curette and the application of Monsell's solution of iron have arrested uterine hemorrhages. Often I apply the pure powder of the subsulphate of iron to the cervix, or a concentrated solution of alum, if the bleeding take place from an eroded cervix. I also occasionally apply to the endometrium fuming nitric acid or the hot iron, a few days after menstruation, without producing other than good results, but only in exceptionally rare and obstinate cases.

Compressing the abdominal aorta, for the purpose of checking excessive uterine hemorrhage, has also proved in my hands a valuable method in three instances where all other means had failed, and the patients were almost moribund when I first saw them.

ARTICLE VI.

ON THE ACTION OF CARBOLIC ACID UPON CILIATED CELLS AND WHITE BLOOD CELLS. By T. MITCHELL PRUDDEN, M.D., Lecturer on Normal Histology in the Medical Department of Yale College, Assistant in the Pathological Laboratory of the Alumni Association of the College of Physicians and Surgeons, N. Y.

RICH as is the literature of the last two decades in records of investigations on the local and general action of carbolic acid upon the living organism, the minute changes which it produces in the cells themselves, seems to have attracted but little attention. To those who have adopted the postulate upon which the Listerian treatment of wounds is based, the study of the action of the antiseptic upon bacteria and allied organisms has seemed very naturally of paramount importance; while those, on the other hand, who denying, or at least not accepting, as yet proven, the the-

oretical considerations in which the Listerian treatment centres, but yet recognizing fully the value of carbolic acid as a topical application, seem to have contented themselves for the most part with very general explanations of its favourable action.

The significant fact that, other things being equal (sanitary conditions, care, etc.), the strict adherence to the Listerian doctrine and details, has, with perhaps the exception of certain classes of operations (ovariotomy, etc.), given results which, so far as statistical data are reliable, seem to be in no wise superior to those obtained by surgeons who use carbolic acid as a dressing agent, but without inflexible adherence to the details insisted upon by Lister, and which, if his postulate be true, would appear indispensable, has suggested the query, whether, after all, the beneficial effect of carbolic acid, which in some measure all acknowledge, may not really be largely due to its direct action upon the tissues of the healing wound. This view, which so far as it was formulated seems to have been the current one before the action of micro-organisms in wounds was postulated and became popular, was persistently urged by Beale¹ in 1872 on theoretical grounds, and has been ably advocated from the standpoint of the practical surgeon by Prof. T. M. Markoe,² in a recent number of this Journal.

In the hope that some light might be thrown upon this important question by observations upon the action of carbolic acid on some of the elementary organisms of living tissues, a series of experiments was instituted the results of which it is the purpose of the present paper to record. The question proposed for solution was: What effects, if any, are produced by solutions of carbolic acid of varying strength, first upon the structure, and second upon the function of certain living cells? The two varieties of cells selected for this purpose were ciliated cells and white blood cells, and these were chosen because with a tolerably well-known structure one of the functional expressions of their life is in well-defined and easily studied movements.

The preparation used was Merck's purified carbolic acid, in crystals, and this was in all cases dissolved in a half per cent. solution of sodium chloride; the latter solution acting in most cases towards living tissues as an approximately indifferent fluid, or its effects being at least well known or determinate. Solutions were used of the strength of 1-20, 1-50, 1-100, 1-400, 1-800, 1-1600, 1-3200. The most extended series of experiments were made upon both ciliated and white blood cells from the frog (*Rana esculenta*), while less extended experiments were made upon both kinds of cells from the rabbit and upon the white blood cells of man. It does not seem desirable to record at length the individual experiments, but simply to describe the methods employed, and give their results. In

¹ Beale, *Disease Germs, Their Nature and Origin*, 2d ed., 1872, p. 279, *et seq.*

² Markoe, *Through Drainage in the Treatment of Open Wounds*, *Am. Journ. Med. Sci.*, April, 1880.

each case a sufficient number of experiments was made to insure the elimination of such errors as isolated or a too limited number of observations in studies on the living tissues are always liable to lead, owing to varying conditions of vitality over which the investigator has no control, and of whose nature or presence he often may not even be aware. Control experiments, in which the indifferent fluid alone was used, were also made in all cases in which the character of the observation made them desirable.

The Action of Carbolic Acid upon Ciliated Cells of the Frog.—Its effect was first studied upon living cells scraped from the palate, and second upon the cells *in situ* on the edge of the tongue of the living curarized animal, with the capillary circulation intact at their base.

In the first series of experiments, the cells¹ having been gently scraped from the mucous membrane, were teased apart on a slide in half per cent. salt solution, protected from pressure by two bits of thin blotting paper on either side, and covered as usual by thin glass. After bringing into the field suitable masses of cells, in which the ciliary movement was vigorous, the carbolic acid in different degrees of dilution was allowed to flow under the cover-glass and was drawn off on the other side by blotting paper in the usual way. In order to avoid such errors as might arise from the concentration of the salt solution by evaporation, it is customary to inclose specimens exposed in this way to the action of fluids, with a rim of oil or paraffine; but when the observation is to be long continued, such an exclusion of oxygen should be guarded against, and hence in these experiments a slow current of the irrigating fluids was kept constantly passing through beneath the cover-glass. It has been shown by Steinbuch, Purkinje and Valentin, Roth,¹ and others, that mechanical influences, such as currents of fluid, are capable under certain conditions of accelerating ciliary movement or even exciting it when it has once ceased. But a slow constant current being maintained in these experiments, alike with the indifferent and the carbolated fluid, this factor was probably made uniform for both.

Under these conditions the effects produced by carbolic acid are briefly as follows: In the strength of 1–20, the ciliary movement ceases on the instant of contact with the cell and the cilia lose their well-defined contours, shrinking to a tangled mass of curled and twisted filaments, which soon gives place to a narrow band of irregular fine granules. The cell body becomes at once deeply cloudy, and then coarsely granular, shrinking rapidly, and the protoplasm is soon resolved into two distinct kinds of material; the one clear, transparent, and feebly refractive: the other, formed in varying quantity, strongly refractive and forming irregular coarse shining reticular masses within the cell, or appearing in the form of

¹ Steinbuch, *Analekten neuer Beobachtungen und Untersuchungen für die Naturkunde*, 1802, p. 66. Purkinje and Valentin, *De phenomeno motus vibratorii*, etc. Wrastl., 1835. Roth, *Virchow's Archiv*, Bd. 37, p. 191.

larger and smaller shining globules or droplets, which may or may not entirely conceal the nucleus. Specimens kept under observation for 35 days showed within the first 48 hours some additional shrinkage, and a tendency to become brownish and dry in appearance, while the shining droplets usually became more or less coalescent and often freed themselves completely from the rest of the cell. After this time no marked change occurred in the cell within the above period. The nature of the shining globules and reticular masses developed from the protoplasm by carbohc acid, which are but partially soluble in alcohol and ether and not at all changed in colour by osmic acid or iodine, the writer was unable to discover.

The action of solutions of 1-50 and 1-100 are closely similar. In a small proportion of cases, especially when the ciliary movement is at all languid, it becomes distinctly accelerated as the acid reaches the cells, and then, which is true for most of the cells at first, the movement becomes slower and usually ceases altogether in a few seconds, although in some cases, especially with the weaker solution, it may persist for several minutes. As the vibration ceases, the cilia may be indistinct in outline, or curved, or twisted, or may stand out from the cell straight and stiff. Then occur degenerative changes in the protoplasm similar to those above described, though less rapidly developed. Shining globules appear in the protoplasm, the nucleus shrinks, not unfrequently exhibiting as it does so distinct movements in the intra-nuclear network; and especially noteworthy in solutions of this strength, is the development in a large number of the cells, within a few minutes, of a wedge-shaped more or less strongly refractive, sharply outlined network, extending from the ciliary border to the nucleus, within which are sometimes seen delicate parallel lines, perpendicular to the free border of the cell. This peculiar network, lying invariably between the ciliary border and the nucleus and never extending below the latter, would suggest a difference in the structure of the protoplasm in this part of the cell which is not without significance in view of the present uncertainty of our knowledge concerning the relations between the cilia and the nucleus and cell body. Aside from a tendency of the shining globules to coalesce and gather outside the cell body within the first 48 hours, no marked change was noticed in cells exposed to the acid for 35 days.

Under the action of solutions of 1-200, the vibration is, at first, in many cases, distinctly accelerated and then becomes slower, the cell body becoming slightly cloudy, and ceases altogether as a rule within a few minutes. But it must be said that under these as well as other conditions, certain cells or groups of cells resist the action of the acid much longer than others which are exposed, so far as can be determined, to precisely the same conditions. After the movement ceases the wedge-shaped sub-ciliary network as well as a few shining globules are sometimes slowly

developed. But neither are as well marked or abundant as when solutions of greater concentration are used. Not infrequently, sometimes before the ciliary movement ceases, larger and smaller hyaline droplets may be seen exuding from the free border of the cell, often in great numbers.¹ If in the use of solutions of the above strength, at the instant when the vibrations cease, the carbolated fluid is washed out by the salt solution they may, under favourable circumstances, recommence and continue for a few minutes but cease permanently, as a rule, in a short time.

With solutions of from 1-400 to 1-800, the vibration is gradually brought to rest usually in from 60 to 90 m., the cilia standing out stiffly from the cell. The structural changes produced in the cell body are inconsiderable; they undergo the same sort of degeneration, but a little more slowly, observed in cells lying in simple salt solution. Here, too, if very soon after the cessation of movement the acid be washed out by salt solution, a restitution of the ciliary vibration often occurs, frequently continuing for a considerable time. It may even be again suppressed by the acid, and once more re-established by the indifferent fluid. In still more dilute solutions, 1-1600 to 1-3200, no characteristic structural changes were observed, but while exposed to the action of the acid, the movement was as a rule somewhat slower and came sooner to rest than when salt solution alone was employed.

A less extended series of observations upon the living ciliated cells from the air-passages of the rabbit showed that upon these the carbolic acid has essentially the same effect, but that they are somewhat more susceptible than those of the frog, both to influences causing structural changes and interference with functional movement.

In the second series of experiments on the ciliated epithelium, in which the action of the acid on the cells *in situ* in the living animal was studied, the very convenient frog plate for the study of the tongue, devised by Prof. Richard Thoma, of Heidelberg, was employed.² If upon this apparatus

¹ This appearance, the occurrence of which under other conditions Virchow described many years ago (Virchow's *Archiv*, Bd. vi. p. 133), is instructive as showing how profound are the changes which cells may undergo without a suspension of functional activity.

² This exceedingly useful apparatus consists of a rectangular plate of brass 12 cm. long by 7 cm. wide, covered above by a thin sheet of hard rubber. The plate is pierced at one end by an opening 2 cm. by 1 cm., into which a polished strip of glass is cemented which is thicker at the outer than at the inner end, corresponding to the difference in thickness of the frog's tongue at the tip and base. Around this glass plate over which the tongue of the curarized frog is gently stretched by pins driven into strips of cork on either side, a narrow rim of brass is fastened, making a gutter around the tongue from which two caoutchouc tubes lead off into a receptacle for the waste irrigating fluid under the table. On one side of the plate are two canula holders, so arranged as to turn in all directions, by means of which the irrigating fluids may be carried through fine glass tubes to any part of the tongue or made to irrigate the whole. The irrigating fluid is supplied from a Mariotte bottle set at a suitable height above the level of the microscope stage upon which the frog plate is clamped

the tongue be stretched as tightly as is compatible with the maintenance of a good circulation, and then covered and suitably irrigated, a most admirable view may be obtained at its edges of the ciliary movement under nearly normal conditions. Although the structural details of the cell bodies in this picture are not readily made out, the movements of the cilia are very distinct, and conclusions drawn from their study rest upon a much firmer basis than those derived from a study of the teased cells alone, since the latter, in the preparation for the experiment, are placed under excessively abnormal conditions. Still each method has its distinct advantages, and neither can be altogether dispensed with.

This series of experiments, between 40 and 50 in number, showed that in general the action of carbolic acid upon the ciliated cells *in situ* is essentially the same as upon the separated cells, except that the former are considerably more resistant to its action. The same degenerative changes in the protoplasm are produced with the stronger solutions, and with these as well as with those considerably dilute a tendency to desquamation is usually observed. The most noteworthy effect produced upon the cells under these conditions by dilute solutions, is their power of holding the ciliary vibration distinctly in check without determining the death of the cell. It is thus possible with solutions of 1-800 to 1-1600 to keep the cilia moving at a very slow rate, but with quite perfect rhythm, for several hours, the movement being often first brought to a standstill by the desquamation of the cells. With solutions of from 1-400 to 1-1600, the movements may be brought to rest, and then, when desquamation has not occurred, restored by irrigation with the salt solution, and this may be done not once only, but four or five times. At each successive application of the acid, however, the inhibitory effect is more readily and quickly produced, until finally all vibrations cease abruptly on contact with the acid, and then the salt solution fails to restore it and the cells undergo the usual degenerative changes. The spectacle of the gradual re-establishment of movement on washing out the carbolic solution is extremely interesting. Sometimes it occurs in a steady progression from one side of the

in the usual way, and the whole so inclined that the waste irrigating fluid will readily flow off.

The advantages of this apparatus are: that any surface exudation is washed away and the picture kept clean and clear; that the tongue may be kept for a very long time under observation, its proper moistening being automatical, and the waste fluids conveyed away without any danger of coming in contact with the microscope; that facilities are placed at the command of the investigator for varying in a multitude of ways the conditions under which the tissues are placed, the changes in irrigating fluids being effected simply by closing one clip and opening another. The tongue furthermore, notwithstanding its greater thickness at the base, is, owing to the obliquity of the glass plate upon which it rests, horizontally placed, and may be covered by thin glass, under which the fluids from the irrigating canulæ can be directed and studied with high powers. This plate is fully described and figured by Thoma in Virchow's *Archiv*, Bd. 65, p. 36.

specimen to the other, the cilia at first vibrating at their tips through a very small arc, and then slowly swaying to and fro, and at last, sometimes almost instantly, breaking into a nearly normal rhythmic vibration, with the most perfect co-ordination of movement between individual cilia. Sometimes the re-establishment of vibration does not occur in a gradual uniform progression, but isolated cilia, or groups of cilia commence to vibrate independently of their neighbours, and may often be seen in full career while those about them are quite still. The same variations may be observed in the cessation of movement. After the cilia have been brought once or twice to rest by dilute solutions, the amplitude of their vibration in the subsequent restorations is, as a rule, much less than normal, their rate of vibration slower, and co-ordination of movement in neighbouring cilia or cell groups very imperfect. In a few cases it was noticed that at the instant of contact of the acid (1-400) with the cells, the cilia suddenly stood straight and stiff as if tetanized, and after remaining so for a few seconds as suddenly broke into rapid vibration, which gradually gave place to the slower movement, which is usual under the action of the agent.

The general results of the above experiments may be briefly enumerated as follows:—

Carbolic acid in moderately strong and concentrated solutions (1-100 and over) causes, either immediately or in a short time, cessation of vibration in living ciliated cells, with rapid characteristic disintegration of their protoplasm and death of the cell.

In very dilute solutions (1-400 to 1-3200) carbolic acid may cause, if long continued, slight degenerative changes in the protoplasm and the death of the cell; but its most noteworthy action is its inhibitory effect upon the ciliary movement. This may be retarded by it or even entirely checked without necessarily determining the death of the cell, for on its replacement by an indifferent fluid the movement may be perfectly re-established and continue indefinitely.

It is not necessary for the purposes of the present paper to enter into the very extensive literature of the ciliary movement, nor to consider at length in how far the above described effects of carbolic are similar to those produced by a number of other agents, the effects of which, ever since the classical investigations of Purkinje and Valentin, have been a favorite theme for amateur and professional study. Suffice it to say, that most of the agents which bring the vibrations to rest, do so, even in dilute solutions, in virtue of their destruction of the life of the cell. To these, sulphuric ether, chloroform, and carbonic acid are exceptions.

It should be further remarked that the power of certain dilute alkalies to temporarily restore ciliary movement, which has come to rest either spontaneously or by contact with certain fluids, is not analogous to that of the salt solution in the above experiments; for the latter acts by simply

washing out a deleterious by an indifferent fluid, while the former induce profound structural changes in the cell, which speedily and invariably eventuate in death.

The Action of Carbolic Action on Living White Blood Cells.—These experiments again fall naturally into two series, in the first of which the effect of the acid was studied up in the cells taken from the vessels and exposed to its action upon the slide; while in the second its effects were observed upon the cells within the tissues and especially upon the phenomena of emigration. The method employed in the first series was essentially similar to that of the first series of experiments on ciliated cells, namely, irrigation beneath the cover-glass. Owing, however, to the liability of such cells as are fixed upon for observation to be floated out of sight by currents of irrigating fluid, great care in manipulation is necessary, and the following procedure was finally adopted as being the most uniformly successful. A small drop of one-half per cent. salt solution being placed in the middle of the slide, and the long middle toe of the hind foot of the frog¹ being carefully cleansed, its tip was snipped off with scissors, and the small drop of blood and lymph which presently exudes was carefully deposited in the centre of the drop of salt solution, and covered by thin glass, the cells being protected by thin filter paper on either side. The advantage of depositing the blood in the drop of salt solution instead of directly upon the slide and mixing afterwards, becomes evident on examining the specimen, for under these circumstances the fibrine does not form in a close clot, but in a very loose network, frequently exhibiting a most exquisite radial arrangement of its fibrillæ about the fibrine granules. The loose network thus formed, while serving a most admirable purpose in preventing the floating off of the white blood cells, yet interferes but little with the free passage of the irrigating fluids in all directions. Irrigation was accomplished by allowing the fluid to drop at slow, regular intervals from a fine canula held by a clamp to the stage of the microscope and attached to a Mariotte pressure bottle; the overflow being drawn off at the opposite side by a strip of twisted filter paper.

If a specimen of frog's blood thus prepared, and irrigated with a half per cent. salt solution, be subjected to continuous observation, at a temperature favourable to the occurrence of amœboid movements, these may frequently be seen to continue for several hours, becoming after a time slower, and finally ceasing altogether, as the cells die, when, in a few hours they disintegrate, leaving but a few scattered granules behind. If, however, instead of irrigating with simple salt solution, a very dilute solution of carbolic acid in salt solution (1-800 to 1-1600) be used, the amœboid movements will be found not to continue as long and to be much more

¹ It is very convenient to make use, for this purpose, of frogs, in which an artificial leucocythosis has been previously produced by snipping off the apex of the heart and allowing considerable blood to flow, and then closing the wound.

slowly executed, and to consist often, especially after the first half hour, not in locomotor movements, but simply in the extrusion and retraction of processes. And, when finally the cells cease to move, they do not disintegrate as rapidly as when the carbolic acid is absent. If the irrigating fluid is more strongly impregnated with carbolic acid containing from 1-800 to 1-400, the movements cease considerably earlier; while if 1-100 be employed, they cease almost as soon as the fluid reaches the cell, and very soon, if its action be continued, the protoplasm may be observed to resolve itself into larger and smaller strongly refractive granules or globules and a finely granular translucent substance, which preserves the form of the shrunken cell body, the nucleus becoming visible with more or less jagged contours. With solutions of 1-50 to 1-20 the movements cease instantly, the cells shrink, becoming coarsely granular, and very soon exhibit in most cases the above-described disintegration of the protoplasm.¹

Thus with very dilute solutions of carbolic acid the amœboid movement of white blood cells is held in check, but may still continue for several hours. With stronger solutions it either ceases instantly or very soon, and the protoplasm undergoes rapid decomposition.²

Such observations as the above are of course valuable only when made in each case with careful control experiments, in which the salt solution alone is employed, the other conditions remaining the same; and then definite conclusions are justifiable only as the result of a large number of observations; the individuality of the cells in their power of executing movements and in their capacity for resisting deleterious agencies, and the marked influence of the general well being of the animal from which they are taken, upon both, being always borne in mind.

Carbolic acid enjoys, and certainly deserves, the reputation of being, even in very dilute solutions, exceedingly inimical to the life of the lower organisms and to cell life in general. The question arises, however, at this stage of our investigation, are the cells whose movements have ceased through the agency of dilute carbolic acid, really dead? In the very numerous and valuable experiments upon its action on infusoria, bacteria,

¹ The action of carbolic acid on the red blood cells has been very carefully studied and described in detail by Huels (*Wirkung der Carbonsäure auf rothe Froschblutkörperchen*-Inaug. Diss., Anklam, 1872). It will suffice here to say in general, that with dilute solutions they shrink, losing their regular contours and becoming variously folded and curved, and, after a time, may swell up, become pale, and disintegrate. With stronger solutions they become granular, and the protoplasm breaks up, forming a homogeneous, brownish-red, strongly refractive material, which may appear either as an irregular net-work within the cell or form globules, which tend to coalesce, and are insoluble in water, but are dissolved by carbolic acid.

² Essentially the same results were obtained from a study of the action of the acid upon the white blood cells of the rabbit and of man. In this case the technique was modified by the use of the warm stage, the irrigating fluids being kept at a suitable temperature by the water-bath.

spermatozoa, etc., the cessation of movement seems to have been generally assumed to be the just criterion of death, and, inasmuch as the conditions of the experiment are usually so complicated and the organisms so minute, it is difficult to prove whether this is justifiable or not, because of the difficulty, in most cases the impossibility, of replacing the organisms under normal conditions so as to see whether or not their vitality is altogether lost or only held in abeyance. This, so far as disinfection is concerned, may, under certain circumstances, be of no little importance, and, in the determination of the capacities of protoplasm in general, it is certainly of the greatest significance. It has been shown in the first part of this paper that carbolic acid in dilute solutions is capable of bringing the ciliary movements to rest, and that if then it remains long in contact with the cells, they die and disintegrate, but if it is washed away in time, the movement may be re-established, showing that in the case of ciliated cells, cessation of movement does not necessarily imply the death of the cell. Is this true of the white blood cells, brought, as we have seen above, into a quiescent condition by dilute solutions of carbolic acid? If the carbolated fluid be carefully washed away from such quiescent cells, before it has been very long in contact with them, it will be found, in fact, that in a certain number of cases, cells which have been under continuous observation, will slowly commence to move again, at first sending out and retracting processes only, but at length exhibiting well-defined locomotion. But the number of cells which do this is comparatively small. While such results are decisive, as determining that the cells brought to rest by means of dilute solutions of carbolic acid are not necessarily dead, it by no means follows that those which do not move by a substitution of the indifferent for the carbolated fluid *are* dead, for they are all, at best, placed under very abnormal conditions.¹ The following series of experiments will throw further light upon this subject.

The action of Carbolic Acid on White Blood Cells within the Living Tissues.—In these experiments the parts used were the tongue, the bladder, and the mesentery of the frog, and the results obtained were essentially the same for all.

For the study of the circulation in the bladder and mesentery, modifications of the above-described Thoma's frog plate were used, differing from that mainly in the size and shape of the plate upon which the animal rests, and the shape and position of the glass upon which the exposed part is laid for study. For the observation of the normal circulation and the phenomena of emigration the bladder is unsurpassed among all the parts

¹ Special stress is laid upon this point, not because the capacity of reducing the activity of amœboid movements or bringing them to rest without killing the cells, is unique in carbolic acid, for we are already acquainted with many other substances which possess the same capacity, such as strong salt solutions, quinia, etc.; but for the sake of emphasizing in reference to cell activity, its inhibitory in distinction from its destructive power.

of the frog which are used for this purpose. To prepare this organ for study, a lateral incision is made in the abdominal wall of a curarized animal, most conveniently on the right side, extending from the posterior end of the trunk about half way to the axilla, care being taken to avoid or ligate a large cutaneous vein which usually runs near the line of incision. A bent canula attached to a large pipette, filled with a half per cent. solution of salt is then introduced into the cloaca and directed forward into the bladder, and fastened in position with a bit of thread passed through the skin just above the anus. The salt solution now being injected into the bladder, either by the breath or by attachment to a suitable pressure flask, the organ as it fills is crowded out through the incision, and, being held in distension by a spring clip attached to the distal extremity of the pipette, it is laid upon the glass disk provided for that purpose in the frog plate and may be covered with thin glass and irrigated in the usual way. It can be examined with high powers, and leaves little to be desired in the clearness and precision with which both the normal and pathological conditions may be studied. It is, however, less well adapted for long continued observations of a special limited area or of a single cell, than the mesentery or tongue, because of the slow movement of the organ, due to the contraction of the smooth muscle cells so abundantly interlacing in its walls. This movement is more troublesome under ordinary circumstances than that induced in the mesentery by the intestinal contractions, because the bladder is exposed to the air over a greater area, and is less readily confined. It is worthy of note, however, that carbolic acid, even in solutions so dilute as to interfere but little with the circulation, very soon reduces this contractility of the smooth muscle cells of the bladder to such nearly complete inactivity, that the observation is but little interfered with. The methods of preparing the mesentery and tongue for study are so well known that nothing need be said here about the technique.

In all of these experiments, for obvious reasons, as small a quantity of curare was used at a dose as was consistent with the attainment of sufficient immobility of the animal.

If the freshly exposed bladder or mesentery of the frog, in which the circulation is active, be irrigated for an instant with a strong solution of carbolic acid (1-20) immediate stasis is produced in all but the larger vessels, the part becomes cloudy, and both white and red blood cells become rapidly shrunk and distorted, and degenerate in the manner above described, when the effect of the same solution was studied upon the extravasated cells. The bloodvessels change their calibre but little before stasis occurs in the larger trunks also, and the part very soon shrivels and commences to reveal the retrogressive metamorphoses which an entire absence of fresh blood involves. If these parts be irrigated with a more dilute solution (1-50 to 1-100) they soon become somewhat cloudy, and stasis will be seen to occur almost immediately in many of the capillaries

(except those which form direct communication between larger arterial and venous trunks), gradually extending to the smaller and larger veins, and then to the arteries, which often dilate considerably, but without, as a rule, any perceptible acceleration of the current. One after another these vessels become crowded with red and white blood cells, the plasma becoming less and less in quantity, and usually within from twenty to ninety minutes all movement ceases, except in the largest trunks, in which a slow current may often continue for a considerable time longer. The details of the manner in which this stasis occurs may be best observed in the mesentery with solutions of 1-100, and with especial clearness in the smaller veins. One may observe in these, as the process advances along them from the direction of the capillaries, that the red blood cells no longer all present a symmetrical form, but are variously distorted, permanently curved or bent, sometimes appearing slightly swollen, while here and there one or more may be seen sticking closely with its side against the wall of the vessel. To this others may join themselves, forming a little heap of distorted cells encroaching upon the lumen of the tube, or, instead of being piled up in heaps, the red blood cells may lie along the wall, side by side, in a single or double layer, thus often forming a complete cylindrical investment to the inside of the vessel, through which the blood current may still pass with considerable, though markedly impaired, velocity. Gradually, however, more and more accumulation occurs until the lumen of the vessel is finally entirely occluded, and the current stops. Then one may see in many cases how the cells become crowded closer and closer together until at last a uniform red mass fills the vessel, which soon becomes partially decolorized, and shows the nuclei with great distinctness. Sometimes the little collection of cells formed along the walls are loosened by the current, and driven along out of sight into the larger channels.

We have thus a most exquisite example of the formation of thrombi and emboli caused, partly at least, by evident changes in the red blood cells of which they largely consist. The white blood cells, under these circumstances, do not tend to collect in the peripheral zone of the current, which is very little developed, however long the circulation may persist; they invariably retain the spherical form, and are mingled indiscriminately with the red cells, and when the latter come to rest remain entangled among them, forming a small part of the thrombotic mass. This condition of affairs, already described by Hueter,¹ under the name of "globular stasis," although, according to that observer, readily undergoing resolution in the skin of the frog, where he chiefly studied it, does not do

¹ Hueter, *Allgemeine Chirurgie*, §§ 193 and 235; also *Deutsche Zeitschrift für Chirurgie*, Bd. 4, Heft 2, u. 3. This condition may, according to this writer, be produced by a number of agents besides carbolic acid, among which are alcohol, ether, chloroform, ammonia, glycerine, etc.

so when far advanced, even under the most favourable circumstances, in the bladder and mesentery. The appearance of the red blood cells as they lie against the walls, under these conditions, is not at all to be confounded with that often seen in diapedesis of the red blood cells. Where the latter process is occurring one or many cells may, indeed, be seen clinging to the wall of the vessel, but that part of the cell which is within, if it form a considerable portion of it, is pendulous, adhering at one point, and waves to and fro in the current, and is beaten about by passing cells. Nothing of this kind is seen in the cells changed by carbolic acid; they almost invariably lie flat against the wall, seem to be stiff and unyielding, and appear to have entirely lost their elasticity. That these effects are due to a purely local cause, is well shown by the fact that the distortion of the red cells and their adherence to the walls, and to one another, is first seen, and most evident throughout, either in the thinnest walled vessels, or in those in which the circulation is comparatively slow. Where fresh blood from the heart is being rapidly driven through the vessels, on the other hand, even though they be quite narrow and thin walled, as in some of the capillaries which form a short or direct communication between large arteries and veins, the changes are tardy in appearing.

If we turn now from solutions of carbolic acid of such concentration as to cause permanent stasis within a short time in these delicate parts, to those of such dilution that under their action the circulation may still continue active for several hours, namely, to solutions of the strength of from 1-800 to 1-3200, we find that within that range of dilution the effects produced are closely similar, and that when the parts are carefully prepared the circulation may often continue, with no tendency to stasis or thrombosis, for at least twenty-five hours, beyond which time observations were not extended. For the sake of convenience we may confine our attention to the effects produced by a solution of the strength of 1-1600, which may be regarded as typical. If we expose either the bladder or mesentery, and irrigate for a few moments with one-half per cent. salt solution, until the animal has recovered from the shock of the operation and the circulation has adapted itself to its new conditions, and then, cutting off the salt, irrigate with the carbolated solution of the above strength, we very soon observe a slight dilatation of both veins and arteries, with no marked change in the capillaries. This dilatation rarely exceeds one-eighth to one-quarter the original calibre of the vessel, and is permanent as long as the part is exposed to the carbolated fluid. The blood current becomes at the same time slightly accelerated for a few moments, and then usually becomes slower than normal, and so continues. At first the usual distribution of blood in the veins and arteries may be noticed, the axial current and the peripheral plasma zone, and within the latter, in the veins, a greater or less number of white blood cells may be seen rolling or gliding slowly along the walls, and even permanently adherent to them. Very

soon, however, the plasma zone becomes less distinct, while the axial zone becomes somewhat broader, and by little and little a large proportion of the white blood cells which were at first fixed to the walls become loosened, and are carried off by the current. While still a considerable number are seen rolling along in the periphery, and even exhibit to a certain degree the well-known appearance of stickiness, this is very much less marked than when an indifferent fluid is used for irrigation, and very few cells, indeed, become permanently fixed. Those, moreover, which do drag along in the peripheral zone are, for the most part, globular, and are not drawn out into the well-known pyriform shapes presented under ordinary conditions. This condition persists as long as the carbolated fluid is continuously applied, and thus twenty-four hours and more of almost unremitting observation may pass, without the detection of a single cell in the act of passing through the walls, or moving in the tissues outside. Such experiments were often repeated, and while in no case was a cell actually seen passing through the wall, a few times, a small number of cells, having the characters of white blood cells, were seen to have appeared in the tissues outside the vessels, but in no case at a great distance from them. We are thus lead to the conclusion that, under the above conditions the irrigation of the mesentery or bladder of the frog with very dilute solutions of carbolic acid (1-1600) prevents, almost entirely, the emigration of white blood cells.

If now the carbolated fluid be replaced by one-half per cent. salt solution, the picture very soon changes. In the course of two or three hours, often much sooner in the bladder, without any marked change in the calibre of the vessels, the white blood cells begin to collect in the peripheral zone of the veins. They seem to be much more adherent to the walls as they glide along; they are seen to catch now and then at some point, and become elongated and drawn out into pyriform shapes, and very soon a greater or less number may be seen to be permanently fixed in the walls, through which certain of them are readily seen to slowly pass and wander off in the tissues. The process of emigration, then, may be held in check by dilute solutions of carbolic acid, but on the replacement of the latter by an indifferent fluid it readily occurs. If now, with emigration in full course, the carbolated fluid be again applied, a few cells may still be observed passing out of the vessels at first, but their movements soon become extremely slow, and shortly cease altogether; most of the white blood-cells in the peripheral zone gradually assume the spherical form and become less adherent, and the plasma zone is finally, to a considerable degree, freed from them.

Thus three times, in the same animal, in the course of twenty-four hours the alternation of irrigating fluids was accomplished, and each time with the same result.

These experiments may be varied in a number of ways. Thus the

mesentery may be simply exposed to the air under irrigation with one-half per cent. salt solution, until emigration is actively progressing and the cells moving through the tissues and coming to the surface between the endothelium in the manner described in detail by J. Arnold,¹ when, on application of the carbolated fluid, not only does emigration soon cease, but also the locomotion in the tissues, and cells which were working their way slowly through on to the surface of the endothelial investment are brought to rest and so remain, often with a little shining knob through on the outside, while the remainder may be more dimly seen perfectly quiescent beneath. Cells which had been under observation in this condition for several hours were seen, on the replacement of the carbolated by the salt solution, to slowly drag themselves through on to the surface where they were floated off by the irrigating fluid. Still again, if a wound be made in the tongue by carefully dissecting off a bit of the mucous membrane from the papillary surface, emigration may be almost entirely prevented for many hours by irrigating with the dilute carbolated solution; or, if allowed to progress under an indifferent fluid, it may be suppressed at any time in the same way.

The most careful scrutiny failed to reveal any structural changes in the white blood-cells rendered quiescent within the vessels or the tissues, by such dilute solutions as 1-1600.

These experiments were performed exclusively upon spring and summer frogs, which were for the most part freshly captured. Large or vigorous animals were invariably chosen, and, as above stated, a minimal dose of curare was always administered. Nevertheless it is not surprising, considering that the lethal dose for the frog is so small,² and that large quantities of the irrigating fluid were used to ensure uniformity in the conditions of the experiment, that in a certain small number of cases, when the irrigation was long-continued, a sufficient quantity was absorbed to cause death, or at least a considerable feebleness of the heart's action before the conclusion of the experiment.³ All such cases were, of course, excluded in making the summary of the experiments on the action of the acid.

Conclusions.—The chief results of these investigations are as follows:—Strong solutions of carbolie acid cause in living, active, ciliated, and

¹ Arnold, Ueber die Durchtrittstellen der Wanderzellen durch entzündete Seröse Häute, Virch. Archiv, Bd. 74, p. 245.

² Plugge, Pflüger's Arch., 1872, Bd. v. p. 540, estimates it as 0.010 grm.

³ It must be confessed that this assumed relation between the feebleness of the heart's action and the absorption of the acid is, in large measure, conjectural; for, in addition to the incompleteness of our knowledge concerning the precise action of carbolie acid upon the heart under ordinary circumstances, the condition of the animal here, under the influence of curare, would doubtless render the exact condition of affairs still more obscure.

white blood-cells, immediate cessation of movement and death of the cells, with speedy disintegration of the protoplasm.

Very dilute solutions of carbolic acid cause retardation or temporary cessation of movement in living, active, ciliated, and white blood cells, which may, under suitable conditions, be restored by the replacement of the carbolated by an indifferent fluid.

Strong solutions of carbolic acid, if applied to the bladder, tongue, or mesentery of the living frog speedily cause stasis and thrombosis, partly, at least, through profound changes induced in the protoplasm of the red and, perhaps, the white blood cells.

Very dilute solutions of carbolic acid, if applied to the bladder, tongue, or mesentery of the living frog, under conditions in which inflammatory changes commonly occur, modifies the usual character of these, by preventing the occurrence of any considerable degree of emigration or locomotion of white blood cells in the tissues, the usual condition of affairs supervening, however, if the carbolated be replaced by an indifferent fluid.

One word should be added in conclusion, in reference to the relation of the above results to the process of emigration in general, and to the healing of wounds under the action of carbolic acid.

First. The more intimately we become acquainted with the process of emigration the less does it seem to possess the comparatively simple character with which it was at first credited. Neither the physical conditions determined by pressure, nor the relative or absolute position of the white and red blood cells within the vessels, nor the assumed glutinosity of the former, nor the existence of minute currents of fluid passing under certain conditions through the walls of the vessels into the lymph spaces outside, nor, finally, the locomotor capacities of the white blood cells themselves, seem alone to sufficiently explain this very curious and complex phenomenon. It seems probable that not the influence of one of them alone, but of all combined, and perhaps of others of whose existence we are not yet aware, is essential to its accomplishment. If this be true, we are at present by no means sufficiently acquainted with the action of the several factors to assign to each its appropriate share in the accomplished result. The latest supplement to the story of the investigation of the action of quinia on emigration¹ teaches, that it is by no means improbable that its inhibitory action is, in some cases, at least due to the change of physical conditions which it induces in the circulating blood, and not entirely to its power of restraining protoplasmatic movements.

Moderately concentrated solutions of salt also possess the power, as

¹ Appert, Der Einfluss des Chinin auf die Auswanderung der weissen Blutkörper bei der Entzündung. Virch. Archiv, Bd. 71, p. 364.

shown by Thoma,¹ of checking emigration, largely, probably, by the induction of a simple change in the physical conditions of the cells, and a dilatation of the bloodvessels and a consequent increase in the rapidity of the current. So in the above experiments, while the carbolic acid unquestionably exerts a paralyzing action upon the white blood cells, and seems to have little evident effect, so far as microscopical observation can determine, upon the bloodvessels, we can still only say with safety at present, that its action upon the white blood cells is at least one of the ways in which it holds emigration in check.

Finally, as to the relation of the results of these experiments to the use of carbolic acid in the treatment of wounds. One of the prominent claims to virtue in its action, both by the devotees to Listerism and the advocates of a modified use of the drug is, that it restrains undue suppuration.

Unfortunately the writer had not at his disposal the facilities for studying the action of carbolic acid upon the process of emigration in the warm-blooded animals, and the value of such observations upon the frog, as those described above, when applied to warm-blooded animals, and to man, each reader must finally decide for himself. The limitations, however, within which observations on one class of animals may be safely applied to another, are becoming daily more clearly defined, and it would seem to the writer, at least highly probable, judging from the above experiments, that a part of the favourable action of carbolic acid in restraining undue suppuration in wounds is due to its direct effect upon the process of emigration, in so far at least as pus is the result of this process, and not of the proliferation of other cells. Whether beyond this it may or may not act beneficently in killing micro-organisms, or whether it may or may not have other less well-defined beneficial effects upon the healing process, are questions upon which these experiments throw no light.

ARTICLE VII.

EXTENSIVE SCALDING FROM PROLONGED EXPOSURE TO STEAM AT HIGH TEMPERATURE. By NORMAN H. CHAPMAN, M.D., M.S., Associate Member of the Biological and Microscopical Section of the Academy of Natural Sciences.

A PERSON can scarcely enter a large hospital in these days of the varied uses of steam, powder, coal oil, and friction matches without seeing one or more cases of burns or scalds; but it is not often that one has the opportunity of observing a large number of these injuries from a single accident. Such an opportunity, however, recently occurred at the Pennsylvania Hospital, and was occasioned by an accident upon the West Jer-

¹ Thoma, Der Einfluss der Concentration des Blutes u. d. Gewebssäfte auf d. Form. u. Ortsveränderung farbloser Blutkörper. Virch. Archiv, Bd. 64, p. 1.

sey Railway at May's Landing. From this accident there were admitted into the wards of Dr. R. J. Levis (under whom I was at the time serving as substitute resident-surgeon) twenty-nine cases of scalding from exposure to steam. Of this number fifteen subsequently died, or a mortality of over fifty per cent.

The mode of occurrence of this accident is somewhat singular and worthy of notice. An excursion train was on its return from Atlantic City to Philadelphia in two sections. The locomotive of the last section ran into the rear car of the first, which was not in motion at the time, and partly telescoped it. A platform sill in the end of the car came in contact with the advancing engine, and struck it in such a manner as to break a joint in what is known as the branch steam-pipe. It was from this broken joint that the steam escaped and shot directly into the car. This steam could not diffuse itself to any extent in the open air, owing to the fact that the hole in the end of the coach was virtually stopped up by the telescoping engine, together with the coincident that the windows of the car were at the time all closed on account of a violent rain storm. The escaping steam being thus forced into a limited and comparatively closed space, the resulting temperature must have been high, and have remained so for a considerable period.

In order to get at an approximate estimate of the degree of heat to which these victims were exposed, let us for a moment suppose that the engine was at the time of the accident carrying one hundred and twenty-five pounds of steam—which is a minimum estimate, an engineer would scarcely think of carrying less,—then the temperature of the confined steam must have been 349° F.¹ As soon, however, as this confined steam came in contact with the atmosphere it began to decrease in temperature, and continued gradually to lose this high heat as it was projected further and further into the car. Now it is a fact well known to practical engineers that a volume of steam escaping from a boiler under high pressure will travel a goodly number of feet, varying of course according to the volume of steam and the pressure under which it escapes as well as the coolness of the surrounding atmosphere, before it is brought down to 212° F., so that it would seem probable that the first steam thrust from the broken joint reached the front end of the car without being reduced to a condensation temperature. This high temperature was not over with the first puff of steam, but by its continual escape until the boiler was exhausted, it was kept up for several moments. After the steam began to blow down, however, and the pressure of the confined steam, as indicated by the gauge, became gradually less and less, the temperature of the escaping steam also declined in a corresponding manner until it reached 212° F., as the last was expelled from the boiler. It is improbable, as I am informed by practical engineers, that the boiler could have ex-

¹ Haswell's Tables on Steam.

hausted itself in less than from fifteen to twenty minutes, and also that the car could have cooled down in much less than half an hour. I do not mean that the temperature was all this time above 212° F., but it was certainly above this point for at least from five to six minutes.

Just the degree of heat required to produce a scald is uncertain. The steam heat of a Russian bath, which is almost identical with the conditions under which the present accident happened, cannot be endured with impunity above 150° F. This temperature, as I have abundantly tested, produces a decidedly uncomfortable irritation of the skin, which lasts for hours. Neumann¹ tells us that a moist heat of from 167° F. to 212° F. will elevate the epidermis, and that 212° F. and over will destroy the skin either in part or throughout its entire thickness.

At the time of the accident only those persons seated near the front end of the car were able to escape before they were exposed to the action of the steam for any number of moments, the remainder of the occupants were detained for a longer or shorter period, fully one-third remaining until they were carried out after the car had sufficiently cooled down to allow persons from the outside to enter with safety. Unfortunately, this accident occurred near a river, a portion of the train standing upon the bridge, and many of those who were able to get out of the car, either from choice or accident, ran directly into the water, where they plunged about, and were with difficulty prevented from drowning themselves. Those who did not go at once into the river were almost as thoroughly drenched by the rain, which was then "pouring in torrents."² The clothing of the majority of the victims was more or less saturated with water upon admission to the hospital.

There was a marked similarity in all these cases as to the location and the extent of surface injured. The parts most uniformly affected were those exposed, or unprotected by clothing, and to which the steam had easy access. The hands, wrists, face, ears, and neck were in each case more or less injured. The scalds were by no means all alike in severity, however, some were much more serious than others; a difference which was mainly due to peculiarities in dress, together with the situation in the car and the order of escape. Those persons seated in the front end of the car and who were among the first to escape, were less seriously injured than those seated in the rear or middle of the coach. Dress also made a difference. Those clad in thin muslin or linen received little or no protection from their clothing. The steam almost instantly saturated any form of cotton or linen fabric which immediately covered the skin, and caused it to adhere sufficiently close to scald. Those who were fortunate enough, however, to have on woollen, either in underwear or outside garments, received no injury except about the head and hands—parts ex-

¹ Handbook of Skin Diseases, Bulkley's translation, p. 256.

² Dr. D. B. Ingersoll, of May's Landing, Letter of Sept. 13, 1830.

posed—their clothing serving as abundant protection to the rest of the body. The women who were, as a rule, clad in muslin and tarlatan garments, were, owing to this peculiarity in dress, much more seriously injured than the men. There were exceptions to this, however, notably two cases, one being that of a lady who had on woollen underwear throughout, and was not scalded except about the head and hands; the other a gentleman, wearing linen pants and an alpaca coat, whose lower extremities were scalded to above the knee and the upper to above the elbow.

It was not until six hours after the accident happened that these cases were admitted to the hospital, and their condition was at that time most distressing. Indeed I know of no class of injuries occurring in civil life that are more intensely painful or produce a more profound impression upon the system at large than extensive burns and scalds. If the injury is cutaneous, and does not entirely destroy the papillary layer of the skin, as it did not in these cases, the agony is extreme.

Upon admission the victims all exhibited a condition of more or less profound shock to the nervous system. At first it seemed almost impossible that so much constitutional depression should accompany the majority of these cases. In fact it was repeatedly observed that the amount of shock seemed greatly out of proportion to the extent of injury. In burns and scalds it is by no means infrequent to observe this disproportion between the amount of shock and injury. Holmes, in his "System of Surgery," says that comparatively slight burns may be followed by great constitutional disturbance. I think, however, that while the scalding may not be, in these cases, the only element which took part in the production of shock, still it is abundantly accounted for when we take into consideration all the preceding and accompanying events. The passengers were excursionists, and many of the men had most likely been drinking before they reached the seashore in the morning. During the day they ate, drank, bathed, and danced. At night when well exhausted they were crowded into the cars and started for home. When the accident happened they either escaped or were carried from the car into a drenching rain storm, or plunged into the river, as the case may be. After being crudely dressed they were additionally exposed to hours of weary waiting in an open station-house, and to railway, ferry, and ambulance transportation. They arrived at the hospital after midnight of the day upon which they started out, where after being cleaned and dressed—a slow process—they were put to bed. Remembering this series of events, and the amount of injury done, it would seem natural to expect a considerable amount of constitutional disturbance.

The scalds were mainly superficial in character, elevating the cuticle into vesicles and bullæ. When first seen the epidermis upon the face and neck was either entirely off or hanging in large pieces, smaller vesicles and bullæ clustered about the ears, and not infrequently the entire cuticle

slipped from the hand like a glove. As a rule the injury did not extend below the papillary layer of the skin, there were instances of deep or gangrenous scalds, however, in which the whole thickness of the corium was destroyed.

These cases all suffered more or less from the inhalation of steam. The majority of them being detained in the car for several minutes, were of necessity obliged to inhale it in large quantities. The steam inspired was of nearly the same temperature as that which came in contact with the integument and produced a somewhat similar injury to the mucous membrane lining the air passages. The buccal cavity, the posterior nares, and the pharynx were all affected in this way. It was owing to this superficial scalding of the mucous membrane of the throat that the symptom of great thirst (which is always a prominent one in burns and scalds) was so well marked in this series of cases. Indeed it seemed almost an impossibility to quench their thirst at all. The after-effect of this superficial scalding was also well marked. It set up a degree of inflammation in the pharynx which seemed inclined to travel downwards along the air-passages, and give rise to serious bronchial irritation; the larynx and larger bronchi becoming almost universally affected, and in many cases there was subsequently developed an inflammation in the smaller bronchial tubes.

Of the twenty-nine victims of this accident admitted to the hospital, seventeen were males and twelve females. Their ages ranged from twelve to forty-six years, averaging twenty-seven. The parts most uniformly affected were the face, ears, neck, pharynx, and upper extremities to the middle or lower third of the forearm. In the women the injuries to the upper extremities extended as a rule to the shoulders, with patches upon the back and chest above the line of the corset. Three of the women were also scalded from the shoe-top to the groin, and the lower extremities of them all were more or less seriously injured. The amount of integument destroyed in each case varied from 260 to 1200 square inches, averaging fully one-quarter of the surface of the body. The temperature during the shock was invariably below the normal, going in some cases as low as 97° F. During reaction, which set in, at from eighteen to thirty-six hours after admission, the temperature as taken in the axilla ranged from 99° F. to 104° F., averaging 101.2° F. During the general fever process, which immediately followed reaction, the highest point touched in each case ranged from 101.6° F. to 105.8° F., averaging 104.2° F. Taking the series, nine cases died from shock or collapse, with but very little attempt at reaction, within thirty-six hours after admission. Out of these nine, vomiting (or rather a regurgitation of the contents of the stomach) was present in eight, diarrhœa in five, and delirium in the same number. Of those who survived the shock, six died (from the seventh to the fourteenth day), two from exhaustion alone, and four adding to this condition marked symptoms of capillary bronchitis. The complications which arose during

the treatment of the twenty cases that did not perish from shock, were numerous. A peculiar and characteristic eruption was developed in fourteen cases; more or less bronchitis and severe bronchial irritation in the same number; a restless, anxious delirium occurred in ten, and delirium tremens in two; troublesome diarrhœa in eight, and occasional vomitings in four; erysipelas of an upper extremity in three; incontinence of urine in two; in one there was œdema of the glottis, and late in the treatment of three cases, abscesses formed in the pinna of the ear, which, when opened, discharged freely, and exposed its cartilaginous structure to view. In six of these cases there was also a partial or complete loss of voice. Ten of the entire number of victims admitted were clad in thin muslin or linen garments; six were known to have been in the river, and three to have had one or more chills prior to admission. There were four walking cases, which, at the time of the accident, were seated in the front end of the car, and fortunately the first to escape.

Notes¹ of ten additional cases which were retained at the seat of accident, and not sent to the hospital, show a similar extent of local injury, and of bronchial disturbance from the inhalation of steam. Of these ten cases, six perished from shock within the first thirty-six hours; three from exhaustion within two weeks, and one made a good recovery in the third week.

A short history of two cases will, on account of their great similarity, give a very good idea of the entire series:—

CASE V.—Mary McD., æt. 27 years, single, Irish, domestic, received superficial scalds over about one-third of the cutaneous surface, involving the face, ears, neck, and the upper extremities to the shoulders, together with patches upon both legs and the left knee. The mucous membrane lining the air-passages was also somewhat affected from the inhalation of steam, most markedly that of the pharynx and buccal cavity. Besides the scalding, there was a lacerated wound upon the outer side of the right wrist, which communicated with the joint. This was the only case in which there was injury other than that caused by steam.

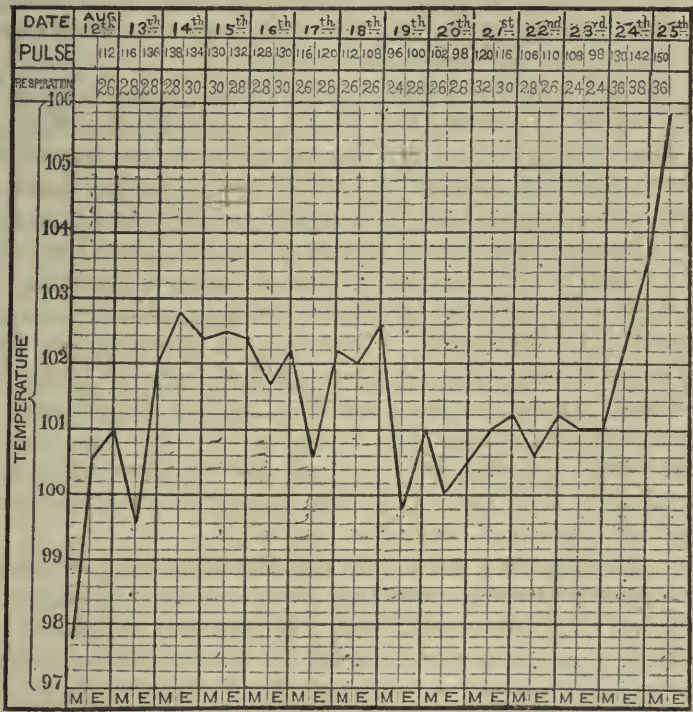
The prominent symptoms were those of shock, great pain, distressing thirst, and partial loss of voice. The constitutional depression was well marked; the extremities were cold; the temperature below the normal; and there was early vomiting of large quantities of undigested food. The period of shock lasted until the second day, when violent reaction set in, and a stage of inflammation took its place. By reference to the following temperature chart it will be observed that about forty-eight hours after admission the temperature of reaction reached 104.6° F., and that from this time a constant fever temperature, with somewhat regular evening exacerbations and morning declines, was maintained.

Diarrhœa began on the second day, and continued more or less troublesome throughout. Upon the third day marked symptoms of bronchitis appeared—paroxysmal cough, hurried and oppressed breathing, viscid expectoration, a sense of soreness of the throat, and of pain under the

¹ Kindly furnished me by Dr. D. B. Ingersoll, of May's Landing, N. J.

and remained so until after death. This eruption was confined to the trunk ; over the chest it was thickly set, there being little or no healthy intervening integument ; over the abdomen, back, and shoulders, it was, however, more scattered. During the second week the inflammation set up in the pharynx by the inhalation of steam began to extend downwards, and forty-eight hours prior to death symptoms of inflammation of the smaller bronchial tubes exhibited themselves. At this time there was hurried breathing, a rapid pulse, slight cough and expectoration, together with great restlessness, associated with an anxious expression of countenance. The percussion note was clear and somewhat high pitched,¹ and, upon auscultation, there were a few firm, moist râles to be heard over the right side of the chest. The eruption and the intervening integument grew somewhat livid as the case advanced, and the temperature, as will be seen by referring to the accompanying chart, steadily increased until, at 105.8° F., death took place; the final struggle being ushered in by a spasm similar to that described in the last case.

Fig. 2.



Post-mortem three hours after death :² The mucous membrane lining the larynx, trachea, and larger bronchial tubes was inflamed and somewhat thickened. That of the middle-sized and smaller tubes was highly congested,

¹ Dr. John Forsyth Meigs remarked, upon examining this case just prior to death, that the percussion note was more than usually high pitched.

² Specimens examined by Drs. John Forsyth Meigs and R. J. Levis.

and cross section of the right lung, in either the upper, middle, or lower lobe, showed these tubes to be filled with a thick, viscid mucus. Large quantities of this viscid mucus was easily pressed from a cut section of the lung, particularly in the lower lobe. There were no evidences of inflammation of the lung tissue proper; it was confined to the bronchial tubes. Upon examining the small intestines no ulcers could be found; upon the posterior wall of the duodenum, however, there was a spot of inflammation surrounded by a moderate amount of localized congestion. There were no other pathological conditions worthy of note which are relevant to the present paper.

It will be noticed in this case that the extent of surface scalded, the amount of shock, and the subsequent reaction, were only moderate; in fact, upon the second morning, the man seemed the most hopeful case in the series. It soon became apparent, however, that troublesome complications were to arise similar to those manifested in so many of the other cases. The reaction, remarkable for its great pyrexia, the eruption, the bronchial irritation, and the rapidly ascending temperature towards the close of a fatal case, were features not only present in the two cases just recorded, but generally common to the series.

Every scald is associated with a certain amount of danger, and it is not always the severest scalds which are the most dangerous. Witness the case just recorded; it was at first thought to be the most hopeful one in the series, but it was attended with a fatal result. Again, "a man once walked into the Pennsylvania Hospital who had fallen into a vat or tank and was immersed in water not hot enough to produce more than a superficial irritation of the derma, and without in any place blistering, yet he died within a few hours."¹ The danger from a scald is not over with the first shock and its subsequent reaction, but it is surrounded with peril in every period of its course. After the period of depression is passed, and it is followed by a proportionate reaction, a period of inflammation is set up as a reparative process. It is during this advanced stage that the internal organs, particularly the lungs and small intestines, are apt to become affected. If the case survive these dangers it has still to endure the exhausting influences of suppuration and repair.

The manifestations of shock were not alike in all of these cases. In some it produced extreme prostration of *muscular power*, stupor, a cold surface and extremities, quick, small pulse, and slow respiration, a state of collapse; in others it was marked by great agitation, excitement, restlessness, sleeplessness, and delirium; in still others *mania-a-potu* exhibited itself. The restless form of expression, however, was by far the most common.

Treatment.—The indications for treatment in these cases were plain and of paramount importance. The shock and constitutional depression were to be combated by such agents as would tend to bring about a safe and not

¹ Dr. R. J. Levis on "Burns," in Philadelphia Medical Times, vol. ix. p. 321.

too violent reaction; and to the local injuries the application of whatever dressings might seem to be most efficacious. For the former condition reliance was placed upon a reaction brought about through the agency of heat and mild stimulation—such as hot drinks of beef soup, milk, coffee, warmth in bed and artificial heat to the extremities, together with quinia and milk punch—in preference to that produced by high or over-stimulation. The idea of a forced reaction by the use of large quantities of alcoholic stimuli has long since given way to the desire to establish a more safe and natural return of the vital powers through the agency of heat and moderate stimulation. To meet the second indication—that of affording relief locally—we have a long series of agents which have, from time to time, been especially advocated. Some of the best of these agents are the benzoated ointment of the oxide of zinc,¹ carron oil,² bicarbonate of sodium,³ collodion and olive oil,⁴ white paint, cosmoline, raw cotton, dredged flour, cold water, starch, brown resin-soap, lime-water with chlorinated ether and glycerine,⁵ gasoline, and carbolized olive oil.⁶

While the recommended local dressings are legion in number, they apparently all aim at the same object, namely, that of protecting the injured parts from exposure to the external air. The desiccating influences of the atmosphere are always distressing to the injured person, and the excessive fetor which emanates from the decomposing tissues of a badly burnt case is equally detrimental to patient and to all who may chance to occupy the same ward or apartment. Local applications should, therefore, be not only soothing and non-irritant, but disinfectant as well, and especially is this a most important point where large numbers of these cases are collected together in crowded hospitals, as was the case in the present instance. With this point in view strongly carbolized oxide of zinc ointment⁷ was employed, and found to answer admirably. The carbolic acid, being a local anæsthetic as well as an antiseptic, had the effect of not only mitigating the pain, but also of materially lessening the offensive effluvia from the body. The ointment was spread upon cloths, laid over the injured parts, and held in place by the roller. About the eyes and

¹ Dr. R. J. Levis, Philadelphia Medical Times, vol. ix. p. 322.

² A soapy emulsion of equal parts of linseed oil and lime-water, which becomes disgustingly offensive when combined with discharges.

³ Herbert Kiernander, Lancet, August, 1879.

⁴ New York Medical Journal, vol. xxiii. p. 174. Is used in the proportion of two parts of collodion to one of olive oil.

⁵ M. de Bruyne, Amer. Journ. Med. Sciences, October, 1871, from British Med. Journal, August 19, 1871. His formula being one part each of hydrate of lime and chlorinated chlorohydric ether to fifty of glycerine.

⁶ Dr. D. B. Ingersoll employed carbolized olive oil in the proportion of 1 part of acid to 128 of oil in the treatment of the cases retained at May's Landing.

⁷ In preparing this ointment the carbolic acid must be incorporated with the oxide of zinc at the time it is made, or it will not be equally diffused; and one part of the acid to thirty-two of the ointment is about as strong as should be employed.

nose, where it was difficult to keep a fixed dressing, cosmoline was smeared with excellent effect. The dressings were removed daily, and, in some cases, where the suppuration was exceedingly profuse, twice during the twenty-four hours.

To meet special indications, a number of different remedial agents were used. As a soothing application to the eye, atropia or a solution of biborate of sodium in camphor water was employed. For the general fever process reliance was placed upon quinia, digitalis, veratrum viride, citrate of potassium, sweet spirits of nitre, and the effervescing draught. For the diarrhoea, opium, chalk, bismuth, and the salts of lead. For the throat and lung complications, gargles and sprays of chlorate of potassium and myrrh, solutions of carbolic acid, etc.; dry cups or turpentine stupes to the chest, with demulcents and expectorants internally, together with quinia and alcoholic stimuli. In preventing contraction and deformity much was accomplished by attending to position and passive movements. Under careful mechanical treatment the cases which recovered presented generally a very decent and tolerable appearance. The cicatrices were all soft and pliable, there were no hardened bands or keloid growths developed in any of the cases, in fact aside from the reddened discoloration the appearance was excellent. Any contraction of the palmar tissues was prevented by constantly keeping the fingers extended to the utmost limit; and any webbing of the fingers by keeping them separated with strips of muslin covered with zinc ointment and well tucked down towards the body of the hand, so that the healing surfaces were prevented from touching one another. By thus almost constantly keeping the parts upon the stretch and employing passive movements whenever the dressings were removed, the resulting cicatrices were very satisfactory.

Remarks.—During the treatment of these cases certain trophic disturbances occurred which are worthy of note. Pre-eminently among these was a characteristic eruption. Out of the nineteen cases that were living at the beginning of the second week fourteen developed this eruption. The lesion was peculiar in character, and its manifestations were almost uniformly the same. As a rule it came out suddenly, or without premonition, from the sixth to the eighth day. It was vesicular in character, and attended by a tingling burning sensation. The vesicles were small, pin-head or millet-seed in size, somewhat elevated above the level of the skin, and of a light or purplish-white colour. They were present in exceedingly large numbers, and irregularly distributed over the chest, abdomen, back, and shoulders, being most closely crowded together upon the chest. On account of the eruption being so thickly set upon the chest, and each vesicle being surrounded by an inflamed areola, there was little or no healthy intervening integument. The vesicles remained discrete, exhibiting no tendency to coalesce, or to rupture spontaneously. When recent, these vesicles contained a clear, watery fluid, but when older their contents

became brown or purulent. This change, from vesicular to pustular, usually took place after the eruption had been out from four to six days. The vesicles thus ran an acute course and terminated in desquamation in about two weeks. This eruption differed from a vesicular eczema in the suddenness of its appearance; in the vesicles not being confluent or exhibiting a tendency to spontaneous rupture, and thus allowing the fluid to dry into yellowish crusts. It differed from a dermatitis in the severity of the local manifestations; in that the skin was not markedly swollen, œdematous, or in a state of high inflammation; in the vesicles not continuing to grow in size after once having made their appearance, and finally when well distended to rupture spontaneously. It was rather a form of miliaria, and more particularly that known as miliaria rubra,¹ due to a suppression of the functional action of the skin, with a subsequent inflammation of the sweat glands. This eruption is of comparatively rare occurrence, and manifests itself most commonly in weak and profoundly debilitated conditions of the system, and seems to be an effort on the part of nature to regain itself.

The question may be raised as to whether this eruption was not due to some topical application, and particularly to the carbolic acid which was used in the oxide of zinc ointment and applied to the burned surfaces. A case of erythema urticatum has been recently reported by H. Zeissl² from the use of Lister's dressing. This eruption "appeared on the eleventh day and localized itself upon the back, sides, and extremities, displaying a diffuse patchy redness." The urine was "dark green," and the eruption faded when the carbolized dressing was abandoned. In the cases under consideration it is improbable that the eruption was caused by the absorption of carbolic acid into the system, for the miliaria ran a definite course which, when completed, subsided while the carbolized dressings were still being employed, and the urine was not charged as in the case mentioned by Zeissl. The suppression of cutaneous perspiration and its poisonous influences upon the blood³ were abundantly sufficient to cause this miliaria rubra.

PHILADELPHIA, October, 1880.

¹ Dühring, *Diseases of the Skin*, p. 231.

² Philada. Med. Times, October 23, 1880, from Cbl. f. Chir. 1880, p. 542.

³ Billroth, "Traumatic Fevers and Traumatic Affections," *Langenbeck's Arch.* vi.

ARTICLE VIII.

ACCIDENTAL AND SUDDEN DISLOCATION OF THE LIVER WITH RECOVERY.

BY ALEX. Y. P. GARNETT, M.D., Emeritus Professor of Clinical Medicine in the National Medical College, Washington, D. C.

THE exceptionally rare occurrence of this accident independent of its intrinsic interest to the medical profession at large, furnishes a sufficient reason for its publication.

After a very diligent investigation through the standard works on the practice of medicine and surgery, I have been unable to find any such case referred to. Frerichs, the highest recognized authority upon the subject of the liver in all of its varied morbid conditions, makes no mention of sudden or accidental displacement of that organ. It is fair, therefore, to presume that the records of medicine present few if any similar accidents, as it is scarcely possible that such would have escaped the observation of such a thorough and indefatigable student in the preparation of a work which is an elaborate and exhaustive treatise upon this organ, embracing the entire field of its pathological possibilities.

CASE.—On the 2d of February last I was requested to see Mrs. R., the mother of several children, about fifty years of age. Five feet three inches in height, very stout, weighing about one hundred and sixty pounds. She had enjoyed good health all her life, which had been active and bustling. She experienced no difficulty at her periods of parturition, all of which had been comparatively easy. She informed me that on the day previous, whilst stooping down hurriedly to pick up some object from the floor she felt a sudden wrench or giving way on the right side. To use her own expression, that her “ribs had slipped in and the bowels thrown up and bulged out.” This was accompanied with severe pain across the abdomen and chest, difficult respiration, a sense of suffocation and consciousness of fulness and distension of the abdomen on the right side. She had attempted to walk but finding that it occasioned so much nausea, pain, and faintness, she was compelled to remain in bed.

A careful examination revealed the following condition. Pulse 102, Temp. 99.5°, Resp. 22. Tenderness on percussion or pressure over the whole right hypochondriac, epigastric, and umbilical regions. Measurements around the body two inches above umbilicus 42 inches. At the umbilicus 42½ inches. Two inches below umbilicus 46½ inches. Percussion on right side, beginning at sixth intercostal space along linea axillaris, elicited resonance as far down as the arch of the thorax. Below that point absolute flatness extending downwards to the crest of the ilium. Along the linea mammalis, commencing at the same point superiorly, the percussion sounds indicated the presence of sound lung tissue but increasing in pitch resembling those found in emphysema, as we approached the margin of the ribs, or upper line of the epigastric space. For two inches below this line, and extending to the left in the direction of the median line there was a clear high-pitched percussion note which indicated the presence of the stomach somewhat thrown forward; proceeding downwards from this point flatness was again encountered which corresponded precisely in extent towards the pelvic region with that obtained along the

linea axillaris. In the median line, commencing at ensiform cartilage, the resonance above mentioned obtained over the epigastric space to the right of the linea media was here apparent, and extended in a subdued and somewhat modified tone as far down as the hypogastric region.

Owing to the thick deposit of adipose tissue upon the abdominal parietes the examination by palpation proved a matter of some difficulty—or rather more unsatisfactory in its results than I had anticipated. I found, however, that the whole region traced out by dull percussion sounds conveyed to the touch a feeling of solidity, unlike that of the opposite side occupied by the bowels filled with flatus and including no doubt the ascending and transverse colon, which had been pushed over by the descent of a large solid body. Examination of the abdomen by inspection in dorsal decubitus showed a marked absence of that symmetry between the two sides which is usually observed in a normal condition. Viewed from a point immediately above, and perpendicular to this cavity there was an apparent fulness on the right side and a bulging or projection laterally corresponding as far down as the crest of the ilium.

Having never met with or read of such an accident as a sudden dislocation of the liver, to which the different symptoms and conditions above described directly pointed, I was somewhat puzzled to determine the exact nature of the case and to arrive at any satisfactory diagnostic conclusion. Summing up the leading features presented in the aggregate and bearing in mind that the health of this patient had been perfect up to the date of the accident or injury and reasoning by exclusion, I became satisfied that there had been a sudden and violent displacement of the liver, that the entire organ had been forcibly thrown down into the cavity of the abdomen dragging along with it the central or movable portion of the diaphragm through its ligamentous attachments to the under surface of that muscle and that this sudden incursion into the abdominal cavity of so large and solid a mass as the liver, had displaced the intestines by pushing them over to the left as indicated by the percussion note on that side of the abdomen. As the extreme pain occasioned by very slight pressure precluded an attempt to force the organ back into its normal position, I ordered an anodyne and directed the patient to lie upon her back, with lower limbs flexed on the pelvis, and woolen cloths saturated with a warm solution of muriate of ammonia kept constantly applied to seat of pain.

On the following day I was surprised to find the patient so comfortable and free from pain or fever. The pulse was 80, and temp. but 99.2°, respirations 20. Measurements compared with those of the previous day showed an average diminution in bulk of one and a half inches. Area of dulness somewhat lessened and respiration accomplished with more comfort. Directed that the fomentations be continued, and an enema of lac assafoetida, castor oil, and warm water be administered at six P. M. The anodyne to be repeated at bedtime if indicated by pain or insomnia. When I entered the room of my patient the next morning, being the fourth day since the occurrence of the accident, she exclaimed, "Doctor, I am well," stating that after the action of the enema, which had brought away a moderate quantity of fecal matter and the expulsion of flatus, she felt greatly relieved, and that when she awakened that morning she found the fulness had disappeared leaving only a sensation of soreness over the abdomen and some tenderness upon being touched.

Examinations by measurements showed an average diminution of four and a half inches. Percussion over area of former flatness disclosed the presence of resonance extending as far up as arch of thorax, the

boundaries of the ascending and transverse colon as well as those of the stomach being easily mapped out; above the margin of ribs along axillary and mammary lines the usual dull sound indicating presence of the liver as far up as sixth rib. To the touch the solid unyielding body had disappeared and given place to the elastic feel peculiar to the intestines.

The sudden subsidence of distressing symptoms followed by the manifest change in all of the physical signs exhibited by percussion, palpation, and measurement convinced me that the diagnosis which I had hesitatingly given at my first visit was certainly correct, and that I had been treating a case of sudden dislocation downwards of the liver which had accomplished spontaneous reduction in the space of three days.

The two features of this case especially calculated to excite an interest in the medical mind will be found in its anatomical and physiological aspects. To a casual observer familiar with the anatomical relations and connections of the liver, its firm attachment to the under surface of the diaphragm by the falciform, lateral, and coronary ligaments, an accident of this nature would appear almost impossible, without the application of such force as would most probably be followed by traumatic lesions fatal to life. The records of military surgery, however, furnish us with remarkable and numerous instances of the extent to which injuries may be inflicted upon this organ and recovery follow. We can readily comprehend how such displacement of the liver as described by Frerichs, may take place under the operation of physical forces gradually and progressively applied, carrying with it in its descent the movable portion of the diaphragm, so that this muscular partition becomes arched convexly downwards. After referring to the many causes which produce a gradual dislocation of the liver he says "that when there is a pleurisy with an abundant purulent effusion, and especially in pneumothorax, marked displacement of this organ in a downward direction occurs not unfrequently under such circumstances, the diaphragm is turned convexly downwards so that its lowest part projects far beyond the margin of the ribs pushing the liver before it into the cavity of the abdomen." Several cases illustrating this condition are referred to by this distinguished author in his exhaustive work on the liver, contrasting so strikingly as it does with the meagre and casual notices given this important organ in its vast domain of pathological conditions, which we find in most or all of the standard works on the practice of medicine. Ziemssen, strangely enough, in his "Encyclopædia of the Practice of Medicine," has omitted the subject of the liver entirely.

Regarding this brief report in its physiological aspects it certainly presents some points of interest. When we consider the part played by so important a factor in the function of respiration as the diaphragm and the vacuum, or hiatus possibly created at the base of the lungs by its sudden descent, it is difficult to conceive why such an accident did not produce a more profound disturbance of that function. Again, anatomists tell us that whilst the vessels and organs passing through two of the

orifices found in the diaphragm for their transmission are free from attachments to this muscle, the third one, occupied by the descending aorta, thoracic duct, vena azygos major, has some connection with the vessel, and that the calibre of the aorta is increased by the contraction of the diaphragmatic muscle through which it passes. It is also true that the two phrenic nerves after reaching the diaphragm are distributed by numerous branches to that muscle, and exercise a controlling influence over its action during respiration. With these anatomical facts before us the question very naturally suggests itself, why under such an accident as the sudden and forcible descent of the diaphragm, possibly destroying the attachments above referred to at its aortic orifice and necessarily producing a dangerous degree of tension upon the phrenic nerves, the resultant mischief did not prove more disastrous?

If, then, the diagnosis was correct in the case here reported, it furnishes us with a singular illustration of the great strain to which, under certain conditions of physical constitution, the vital organism may be subjected with comparative impunity. A week's confinement to bed followed by the application of a broad elastic band around the abdomen, directed to be worn for an indefinite period, constituted the remaining treatment deemed necessary in this case.

ARTICLE IX.

THE VALUE OF HOMATROPINE HYDROBROMATE IN OPHTHALMIC PRACTICE.

By S. D. RISLEY, M.D., Lecturer on Ophthalmoscopy in the University of Pennsylvania, Ophthalmic and Aural Surgeon to the Episcopal Hospital at Philadelphia, etc.

IN the number of this Journal for April, 1880, the writer, in an article on the "Relative Value of the Sulphates of Atropia and of Duboisia in Ophthalmic Practice," gave the impressions he had received from the use of duboisia sulphate in the correction of *one hundred and forty cases* of refraction error.

The very great advantage in the use of duboisia, as there set forth, is the greater rapidity of its action in paralyzing the accommodation, and the fact that it resigned its control in from one-third to one-half the time required by atropia. Subsequent experience only served to confirm and strengthen the conclusions then reached, so that in his hands, for the purpose of correcting the errors of refraction, the new mydriatic had quite replaced the old. Nevertheless, although greatly superior to atropia for this purpose, there was still much to be desired. Even in the use of duboisia, from five to seven days were required between the first instillation and the full return of the accommodation. The pupils were still later in regaining their complete activity. Then, too, some patients manifested

an unusual susceptibility to the constitutional impression of the drug, either due to some idiosyncrasy or to unusually patulous tear ducts.

When used as there directed (in two-grain solution), the annoyance was not greater than from the use of atropia in four-grain solutions; it was nevertheless desirable to avoid, if possible, the dry throat and other unpleasant effects which followed its use in numerous instances.

On October 5th, Mr. Geo. I. McKelway kindly called my attention to an article in *New Remedies* for October, 1880, on "Homatropine, a new rival of Atropine," and furnished me with a sample of the drug. I immediately began experimenting with it in solutions of i, ii, iv, and vi grains to fʒj, of distilled water. Up to the present time, November 16th,¹ thirty-seven cases of refractive error have been corrected under its use, and the most painstaking record made of its power over the ciliary muscle. The results are carefully recorded in the accompanying table.

In No. 1, one drop of a solution 1 gr. to fʒj was instilled in each eye. After twenty-five minutes there was no change in the condition of the pupil or range of accommodation. Another drop was then instilled. In thirty minutes from the first instillation, the pupils were dilated to medium size, but reacted sluggishly when facing the window, and the accommodation was still normal. A drop of the two-grain solution was then instilled. In sixty minutes from the first application and thirty after the two-grain solution, the pupils were widely dilated and fixed, and the range of accommodation had sunk from a near point of 5'' to 8½'' with + 1½, i. e. from $\frac{1}{A} = \frac{1}{6}$ to $\frac{1}{A} = \frac{1}{24}$. In seventeen hours the iris had in part regained its resiliency and the range of accommodation was completely recovered. Two drops of the two-grain solution were now instilled into each eye and repeated in ten minutes. In forty minutes the pupils were dilated *ad max.* and fixed, and only a small range of accommodation remained. Two more drops of the same solution were again applied to each eye, the lids being held apart in order to insure a thorough application. In one hour and a half from the first instillation there was no range of accommodation remaining.

The patient was suffering greatly from retinal irritation. Had for many months been a victim to headache, undue sensitiveness to light, etc. In view of this he was allowed a two-grain solution at home to be used every three hours. He returned in twenty-four hours with all symptoms of retinal irritation gone. Three hours had elapsed since the last instillation of his solution, and it was found that with + 1½^s Jr. 1 could be read up to 8'' but no nearer to the eye. The drops were again put in the eyes freely, and in one hour the accommodation was entirely paralyzed, and his correcting glasses ordered. The drops were stopped, and after thirty-six hours, during which interval he was not seen, the near point had returned to 5½''. The pupils, however, had not been fully restored. The patient stated that eight hours after the last use of the drops, he could read ordinary print without difficulty.

¹ Since the above was placed in type a new supply of homatropine has been received, and seven additional cases corrected under its use; but at the present time, Nov. 27th, there has been no cause for changing the opinions expressed in this paper.

The result in this case was very gratifying. In the first place the action of the ciliary muscle had been entirely suspended by a two-grain solution of the drug, and in a comparatively very short time had regained its function. Further than this, in spite of the repeated instillations, cautiously at first, with the utmost lavishness afterwards, there had not been the slightest constitutional effect manifested, and there had been no local irritation.

Encouraged to proceed by this first result, in Case II. a four-grain solution was used. In one hour there was only a small range of accommodation remaining. In O. D. $-\frac{1}{2}^{\circ}$ ax. 165° was selected, in O. S. $-\frac{1}{60}^{\circ}$ ax. 75° . The solution during the next twenty-four hours was instilled every three hours except between 10 P. M. and 8 A. M. The same glass, however, was selected. A two-grain solution of duboisia sulphate was then used three times in twenty-four hours, but it only served to verify the correctness of the results obtained under homatropine. In fifteen of the thirty-seven cases in which the homatropine was used, the results were verified by the use of atropia or of duboisia, and in only three instances, Nos. 25, 36, and 37 in the table, was there any great change in the glass selected. In two of these the measurement was made in less than two hours from the instillation. In one of these cases, one hour after the instillation of a six-grain solution, $+\frac{1}{60}^{\circ}$ for O. D. and $+\frac{1}{72}^{\circ}$ for O. S. were selected, giving $V \frac{20}{XX}$, and with $+\frac{1}{12}$ added Jr. 1 was read from $12''$ to $9''$. On the following day after the use of duboisia, the same cylinders were chosen combined with $+\frac{1}{36}^s$. $V \frac{20}{XX}$.

In other cases on subsequent examination under atropia or duboisia, slight changes were made in the glasses at first chosen under homatropine, but not greater than are often made after the continued use of atropia or duboisia.

It also happened that where the first examination was for any reason not satisfactory, and where the homatropine was continued, a second examination revealed a slightly higher degree of hypermetropia or astigmatism. More frequently, however, only a greater certainty in placing the direction of the cylinder axis was observed, or an improved sharpness of sight with the same glass at first selected; due, no doubt, to the subsidence of the choroido-retinal irritation.

The method used for determining the state of the accommodation was, during the paralysis, by the addition of $+\frac{1}{12}^s$ to the correcting glasses, *e. g.*, with $+\frac{1}{12}$ added, if the paralysis of the accommodation were complete, Jr. 1 could be read at the focus of the glass, *i. e.* $12''$ —but theoretically no nearer to the eye. Many persons, however, after the prolonged use of either atropia or duboisia, will read Jr. 1 with $+\frac{1}{12}$ added to the correcting glass from $10\frac{1}{2}''$ to $12''$; for the reason that an absolutely clear image is not necessary to read Jr. 1. After homatropine there was no difference in this respect, and where the range was not greater than $1\frac{1}{2}$ the paralysis was considered complete. Due allowance was made for the distance between the convex glass and the nodal point of the eye.

No.	Age.	Length of use.	Return of accommodat'n.	Formulae of correction.	Remarks.
1 23		{ 1 hr. 24 hrs.	17 hours 36 "	{ O.D. + $\frac{1}{60}$ ^s O.S. + $\frac{1}{60}$ ^c ax. 90°	Single test consecutive days with no change. Pupils not fully restored.
2 33		24 "	.....	{ O.D. - $\frac{1}{72}$ ^c ax. 105° O.S. - $\frac{1}{60}$ ^c ax. 75°	Confirmed under Duboisia.
3 26		30 "	24 "	{ O.D. + $\frac{1}{12}$ ^s + $\frac{1}{60}$ ^c ax. 105° O.S. + $\frac{1}{12}$ ^s + $\frac{1}{60}$ ^c ax. 75°	
4 11		48 "	30 "	{ O.D. + $\frac{1}{36}$ ^s + $\frac{1}{24}$ ^c ax. 90° O.S. + $\frac{1}{24}$ ^s + $\frac{1}{24}$ ^c ax. 120°	Not seen until after 30 hours. Sunday intervened, lengthening the use. Read easily in eight hours.
5 21		60 "	24 "	{ O.D. + $\frac{1}{12}$ ^s O.S. + $\frac{1}{36}$ ^s + $\frac{1}{72}$ ^c ax. 90°	
6 20		20 "	24 "	{ O.D. + $\frac{1}{60}$ ^c ax. 90° O.S. + $\frac{1}{72}$ ^c ax. 90°	
7 43		24 "	.....	{ O.D. + $\frac{1}{24}$ ^s + $\frac{1}{60}$ ^c ax. 120° O.S. + $\frac{1}{24}$ ^s + $\frac{1}{48}$ ^c ax. 60°	Confirmed under Duboisia.
8 13		2 { Jr. vii. p. p. 7'' 4½ hours		{ O.D. + $\frac{1}{12}$ ^c ax. 120° O.S. + $\frac{1}{48}$ ^s + $\frac{1}{12}$ ^c ax. 105°	Duboisia substituted — slight change in O. S.
9 38		24 "	17¼ "	{ O.D. + $\frac{1}{60}$ ^c ax. 105° O.S. - $\frac{1}{42}$ ^c ax. 180°	Slight dizziness from drops complained of.
10 23		8 "	16 "	All glasses rejected	Neuritis optici. Glasses rejected in former trial after prolonged use of Duboisia.
11 22		48 "	.....	{ O.D. - $\frac{1}{72}$ ^s O.S. - $\frac{1}{72}$ ^s	Spasm of accom. Atropia substituted to subdue remaining retinal irritation.
12 44		40 "	24 "	{ O.D. - $\frac{1}{48}$ ^s O.S. - $\frac{1}{12}$ ^s - $\frac{1}{72}$ ^c ax. 180°	
13 47		20 "	24 "	{ O.D. + $\frac{1}{6}$ ^s + $\frac{1}{48}$ ^c ax. 90° O.S. + $\frac{1}{9}$ ^s	Same result under atropia two years before.
14 36		48 "	48 "	{ O.D. - $\frac{1}{16}$ ^s - $\frac{1}{12}$ ^c ax. 120° O.S. - $\frac{1}{16}$ ^s - $\frac{1}{16}$ ^c ax. 75°	Not seen for forty-eight hours; pupil then normal.
15 37		2½ "	Not seen	{ O.D. + $\frac{1}{60}$ ^c ax. 90° O.S. + $\frac{1}{48}$ ^c - $\frac{1}{72}$ ^c ax. 30°	
16 10		16½ "	24 hours	{ O.D. + $\frac{1}{60}$ ^s O.S. + $\frac{1}{60}$ ^s	Jr. i. read 2'' nearer than at first test.
17 53		22 "	.....	{ O.D. - $\frac{1}{4}$ ^s - $\frac{1}{24}$ ^c ax. 150° O.S. + $\frac{1}{24}$ ^s - $\frac{1}{12}$ ^c ax. 30°	
18 41		26 "	.....	{ O.D. + $\frac{1}{36}$ ^s O.S. + $\frac{1}{36}$ ^s + $\frac{1}{72}$ ^c ax. 120°	Confirmed under Duboisia; latter complained of.
19 12		60 "	Not seen	{ O.D. - $\frac{1}{10}$ ^s - $\frac{1}{72}$ ^c ax. 60° O.S. - $\frac{1}{14}$ ^s - $\frac{1}{60}$ ^c ax. 120°	
20 43		23 "	23 hours	{ O.D. - $\frac{1}{60}$ ^c ax. 180° O.S. - $\frac{1}{72}$ ^c ax. 180°	
21 20		2 "	.....	{ O.D. - $\frac{1}{7}$ ^s - $\frac{1}{60}$ ^c ax. 180° O.S. - $\frac{1}{10}$ ^s - $\frac{1}{72}$ ^c ax. 180°	Confirmed with slight change under Duboisia.
22 55		2 "	48 "	{ O.D. + $\frac{1}{72}$ ^c ax. 30° O.S. + $\frac{1}{72}$ ^c ax. 120°	Not seen for 48 hours; pupils then normal.
23 38		72 "	27 "	{ O.D. + $\frac{1}{48}$ ^c ax. 100° O.S. + $\frac{1}{48}$ ^c ax. 100°	Use protracted by interruption from sick-headache to which she is subject.
24 28		24½ "	.....	{ O.D. + $\frac{1}{36}$ ^s O.S. + $\frac{1}{36}$ ^s + $\frac{1}{60}$ ^c ax. 90°	Confirmed under Duboisia.
25 19		1 "	.....	{ O.D. + $\frac{1}{36}$ ^s + $\frac{1}{60}$ ^c ax. 90° O.S. + $\frac{1}{36}$ ^s + $\frac{1}{72}$ ^c ax. 90°	Duboisia substituted. { O.D. + $\frac{1}{60}$ ^c ax. 90° } selected under homatropine. { O.S. + $\frac{1}{72}$ ^c ax. 90° }
26 20		{ 1 " 2 "	16 " 24 "	{ O.D. + $\frac{1}{48}$ ^c ax. 90° O.S. + $\frac{1}{48}$ ^c ax. 90°	Single test consecutive days with return of accom. between. No change from first result.
27 24		1¼ "	22 "	{ O.D. + $\frac{1}{15}$ ^s O.S. + $\frac{1}{15}$ ^s + $\frac{1}{60}$ ^c ax. 90°	Single test. Read without glasses in ten hours.

No.	Age.	Length of use.	Return of accommodat'n.	Formulae of correction.	Remarks.
28 24		6½ hrs.	.....	{ O.D. + $\frac{1}{72}^{\circ}$ ax. 100° O.S. + $\frac{1}{72}^{\circ}$ ax. 105°	Confirmed under Duboisia.
29 26		72 "	23 hours	{ O.D. + $\frac{1}{72}^{\circ}$ + $\frac{1}{72}^{\circ}$ ax. 105° O.S. + $\frac{1}{48}^{\circ}$ ax. 7½°	Sunday intervened, protracting use.
30 39		46½ "	24 "	{ O.D. - $\frac{1}{24}^{\circ}$ ax. 90° O.S. - $\frac{1}{48}^{\circ}$ - $\frac{1}{36}^{\circ}$ ax. 90°	
31 35		23½ "	24 "	{ O.D. + $\frac{1}{60}^{\circ}$ + $\frac{1}{48}^{\circ}$ ax. 90° O.S. + $\frac{1}{60}^{\circ}$ + $\frac{1}{48}^{\circ}$ ax. 90°	
32 24		44 "	Not seen	{ O.D. - $\frac{1}{4}^{\circ}$ - $\frac{1}{60}^{\circ}$ ax. 30° O.S. - $\frac{1}{4}^{\circ}$ - $\frac{1}{60}^{\circ}$ ax. 150°	
33 25		1 "	.....	{ O.D. + $\frac{1}{60}^{\circ}$ ax. 105° O.S. + $\frac{1}{60}^{\circ}$ ax. 75°	Duboisia { O.D. + $\frac{1}{48}^{\circ}$ ax. 90° substituted. { O.S. + $\frac{1}{48}^{\circ}$ ax. 90° selected under homatropine.
34 41	{ $\frac{1}{2}^{\circ}$ " $1\frac{1}{2}^{\circ}$ "	16 hours Not seen		{ O.D. + $\frac{1}{48}^{\circ}$ + $\frac{1}{60}^{\circ}$ ax. 90° O.S. + $\frac{1}{60}^{\circ}$ + $\frac{1}{60}^{\circ}$ ax. 60°	Two consecutive tests with return of accommodation between.
35 7		3 "	21 hours	{ O.D. + $\frac{1}{48}^{\circ}$ + $\frac{1}{72}^{\circ}$ ax. 75° O.S. + $\frac{1}{48}^{\circ}$ + $\frac{1}{48}^{\circ}$ ax. 105°	
36 41		6 "	.....	{ O.D. - $\frac{1}{16}^{\circ}$ ax. 60° O.S. - $\frac{1}{24}^{\circ}$ ax. 140°	Atropia { O.D. - $\frac{1}{16}^{\circ}$ ax. 60° substituted. { O.S. - $\frac{1}{48}^{\circ}$ ax. 120° selected under homatropine.
37 26		1¼ "	22 "	{ O.D. + $\frac{1}{60}^{\circ}$ + $\frac{1}{60}^{\circ}$ ax. 75° O.S. + $\frac{1}{60}^{\circ}$	Duboisia { O.D. + $\frac{1}{60}^{\circ}$ ax. 75° substituted. { O.S. + $\frac{1}{60}^{\circ}$ ax. 105° selected under homatropine.

In many instances, as in No. 26 in the table, no change in the glass was made after that first selected, although several subsequent trials were made. In this case, at the end of one hour after the first instillation of a six-grain solution of homatropine, the accommodation was entirely set aside + $\frac{1}{48}^{\circ}$ was selected for each eye, which gave him $V = \frac{20}{xx}$, and he steadfastly adhered to this glass at each subsequent examination. In Case 37 a six-grain solution was used. One hour later, she selected + $\frac{1}{60}^{\circ}$ ax. 75° for O. D. and + $\frac{1}{60}^{\circ}$ ax. 105° for O. S., with these $V = \frac{20}{xx}$ (?) in each eye. With + $\frac{1}{12}^{\circ}$ added Jr. 1 was read up to 7'', but the accommodation soon failed and the print blurred even at 10''; thus showing a range of accommodation of $\frac{1}{60}$ remaining. The following morning, twenty-four hours later, she could read Jr. 1 up to 8'', the original near point recorded being 7'' for the right eye and 6½'' for the left; thus showing that the normal range of accommodation had not been fully regained. The patient, however, was in feeble health, which may in part have caused the delay in regaining full control of the ciliary muscle. In contrast to this case is No. 27, a young physician in vigorous health with $H = \frac{1}{18}$. The examination was made one hour and a quarter after the instillation of two drops of a six-grain solution in each eye, which was repeated in half an hour. There was not a vestige of the accommodative power remaining, and he selected + $\frac{1}{18}^{\circ}$ for each eye, with which $V = \frac{20}{xx}$. These glasses were ordered.

He afterwards related that when he left the office at 11.30 A. M., he found great difficulty in going about in consequence of his blurred sight, that by the middle of the afternoon the annoyance had largely disappeared, and he could read large print without glasses, and at eight or nine o'clock in the evening he read a leader in the *Public Ledger* without difficulty. The following morning twenty-two hours after the last use of the drops he had regained fully his power of accommodation, but the pupils were still 4 mm. wide, facing the light. He was thus deprived of the use of his eyes less than one day, whereas had duboisia been used, at least four days and possibly six must have been lost from his work; and atropia would have extended the paralysis of accommodation to at least ten days.

The writer's experience has differed materially from that of other observers regarding the conjunctival irritation. In not a single instance has there been more annoyance from its use than might have been occasioned by a drop of distilled water. In one instance a lady thought the drops made her "drowsy," and one patient, a gentleman, said they made him dizzy, but it was a matter of small importance, since he walked about without the slightest difficulty, and it may have been due solely to his refractive error. There was no other complaint, from any one, about the constitutional impression of the drug. In several instances it was noticed the lips were a little parched, but the annoyance from the constitutional influence has been so slight as to be justly excluded from view. In almost every case the question was asked if they noticed any unpleasant effects from the drops; the almost invariable answer was in the negative, except from the blurring of the sight.

Several of the cases here tabulated were attended by marked retino-choroidal irritation, and they were in a number of instances allowed a two-grain solution of the drug to use at home with direction to instil one drop in each eye every three hours. Under its use, the undue sensitiveness to light, and the frontal pain, which so constantly attends these cases, rapidly subsided, and the progress was in all respects quite as satisfactory as in similar cases treated by the older mydriatics, with the added advantages of entire absence of constitutional effect of the drug and the early return of the accommodation.

Owing to the very small supply of the homatropine it was not used in the treatment of inflammatory troubles.

It commends itself very highly for the purpose of simple dilatation of the pupil for careful ophthalmoscopic examination of the media and eye ground, since the annoyance disappears sooner than when atropia or duboisia have been used. A solution of homatropin gr. ij, f3j, is sufficient for this purpose. In the few cases in which the time was noted, from twenty to thirty minutes were required for the maximum dilation, or about the same time required by a corresponding solution of atropia sulphate. Duboisia is more rapid in its action, requiring about seven to ten minutes

for maximum dilatation, except in old people, where the pupil dilates less readily with either of the mydriatics.

The strength of the solution used seemed to have but little if any influence over the time for the return of accommodation: *e. g.*, in No. 27, a six-grain solution was used, but he could read in ten hours, and the accommodation was found in full force in twenty-two hours, possibly sooner, since no opportunity for an earlier examination was afforded. This conclusion is fully justified by the result in Nos. 9, 10, 26 and 34. The result in those cases where the weaker solutions had been used did not show an earlier return of function.

The experience gained from these cases gives ample encouragement for the continued use of the new mydriatic, and has served from first to last to steadily strengthen the conviction, that in homatropine ophthalmic surgeons have not only received a valuable addition to the mydriatics already in use, but one which fairly lays claim to superior merits when used for the correction of the errors of refraction.

From the foregoing, the following conclusions seem fully justifiable:—

1. That homatropine hydrobromate in solutions of two, four, and six grains to the ounce is competent to paralyze the accommodation.

2. That in from sixteen to thirty hours, this paralysis entirely disappears.

3. That dilatation of the pupil accompanies the paralysis and is more persistent; the probable duration being forty-eight hours.

4. That it is no more liable to produce conjunctival irritation than atropia or duboisia.

5. That it produces far less constitutional disturbance than either of the old mydriatics.

The writer takes great pleasure in acknowledging the important assistance given by Dr. B. Alexander Randall in the preparation of this paper and his patient care in tabulating the results.

ARTICLE X.

PERITYPHLITIS IN CHILDREN ILLUSTRATING POINTS IN THE DIFFERENTIAL DIAGNOSIS OF HIP-DISEASE. A REPORT OF SIX CASES. By V. P. GIBNEY, M.D., of the Hospital for the Ruptured and Crippled, New York, Member of the American Academy of Medicine, etc.

In the literature of perityphlitis one can find many cases in children, and many are interesting on a close study from the fact that symptoms pointing toward hip-disease have been recorded. Sufficient prominence does not seem to have been given to these points of similarity, however, and as several cases have come under my own observation it has occurred to me

that such might be placed on record with a view of illustrating more fully some points in the differential diagnosis of hip-disease.

CASE I.—Male, æt. 6 years, was admitted to the hospital Sept. 21, 1878, with a history as follows: Absolutely free from hereditary diseases, or the cachexia which often follows in the wake of infantile disorders. True, in the early spring of 1878, he had some fever which, to use the mother's expression, made him "deaf, dumb, and blind," yet he made an excellent recovery after six weeks, and was in good health until the beginning of September (three weeks prior to the day he presented at the hospital), when he came in from play reporting to his mother that he had had a fall. The child's sleep was disturbed the same night; he complained of general soreness, and was apparently quite feverish. No contusions could be found, yet he continued from that time forth to grow more lame, and to sleep more uneasily; in fact it was difficult to get a position in bed that would be at all comfortable for any length of time. While quiet the little patient was free from pain, but any movement caused him to cry out sharply. He has limped from the very beginning, favouring the right limb; at times has been able to go about only on the hands and knees, and at other times he has walked comparatively erect. It was not ascertained whether the patient was constipated during this period, or whether he had vomited, or whether he had eaten anything that would be likely to lodge in the appendix. The mother insisted only on his high fever. The nurse soon discovered that he was obstinately constipated some days after admission.

The case had been regarded as one of dislocation, and an attempt had been made at reduction under ether. This was three or four days previous to admission to hospital, and being sent to one of our consulting surgeons, he could find no evidence of dislocation, but reported it as one of severe strain of the hip-joint which would probably eventuate in disease of this articulation.

The expectant treatment was employed in the hospital. It was recorded, however, that the boy was fairly nourished, could only stand when assisted, and could not walk at all; that the right thigh was flexed on the pelvis at an angle of nearly 90° , extreme flexion being admissible while extension was resisted by muscular action; that there was some swelling about the hip and thigh obliterating the fold; and that further examination was postponed, so excessive was the tenderness. His vital signs were not even recorded, but on the 26th, five days after admission, the pulse in the evening was 120, respiration 36, temperature $101\frac{3}{4}^\circ$; and at the same time next day the record stood 124, 27, $103\frac{3}{4}^\circ$. From this date until Oct. 16th the temperature ranged between 101° and $103\frac{3}{4}^\circ$ for the evening, while in the morning it was normal.

Oct. 2. It was observed that there was marked tenderness in the inguinal region, with well defined induration above Poupart's ligament, that all the movements at the hip, save extension, could be made with care, and that the boy could easily bear his entire weight upon the limb. Joint disease was readily excluded, and the lesion, an inflammatory one, definitely located in the iliac fossa. He is losing flesh daily.

16th. The infiltration which has recently extended from Scarpa's space up into the iliac region has now become more circumscribed and forms a long oval-shaped tumour over Poupart's ligament; yet the integument is of normal thickness, and his constitutional disturbance is less marked. The thigh has become acutely flexed.

26th. Abscess pointing, and incision made at the summit about an inch

in width, and at least a pint and a half of pus of good consistence was evacuated. No antiseptic precautions were employed, and on Nov. 2 the discharge had very much diminished, the boy had regained considerable flesh, and convalescence seemed fully established.

November 30. Wound closed; thigh almost completely extended, and the boy walks with very slight lameness.

December 28. On examination this morning, pursuant to discharge from the hospital, there is found perfect motion at the hip, no pain, tenderness, or infiltration, and freedom from lameness. The cure is complete.

One month later he was seen, and examined with the above result.

This case was one most likely of primary uncomplicated perityphlitis, and yet the signs three weeks after the invasion were those we are accustomed to find very prominent in the second stage of hip disease. The history, however, precluded such a diagnosis. It seems strange though that a specialist should regard it as dislocation.

CASE II.—Male, æt. 12 years, was admitted July 6, 1870, with a moderately good family history. He fell from a height of three feet in Dec. 1869, and until June 10—for six months—"did not complain much." In June, however, a small tumour appeared in the right groin above Poupart's ligament, and was treated for hernia. At the same time there were certain symptoms pointing toward disease at the hip, viz.: lameness, loss of flesh, screaming at night (waking, however, out of sleep).

He applied at the Out-door Department of the Hospital June 6, 1870, never having been treated elsewhere, and the records show "oblique inguinal hernia right side," and "hernia reduced and truss applied."

Admitted as above recorded July 6th, and noted as having clean tongue, pulse of 92, rather emaciated, and walking with a marked limp. It is further recorded, I find, that the fold of the nates is lowered, that there is tenderness on pressure behind trochanter and in the groin, that concussion of the hip by striking the knee gives pain in the groin, and percussion of the trochanter induces pain; that he lies in bed with the thigh semiflexed; that passive motion is painful, and that the thighs measure the same. The diagnosis is morbus coxarius right side, and a fly blister is applied, while cod-liver oil and the syrup of the iodide of iron are ordered.

July 31. Little change; tenderness in groin well marked; thigh considerably flexed.

Aug. 8. Points of induration and marked tenderness developed over and below the anterior superior spinous process. The hernia is not now apparent, and the truss is removed.

24th. Abscess opened by incision, and on the 31st the sac was explored by means of a probe, no necrosed bone being found, and no foreign bodies. The discharge at no time was great, and by Sept. 22d the wound had healed with some remaining induration about its margin.

Oct. 22. The induration is almost gone, yet the hernia has again become troublesome. He walks without any lameness.

Nov. 5. He has perfectly recovered with the exception of the hernia, for which a truss is reapplied, and he is discharged to continue under observation in the out-patient department.

He reported only a few times after this, and was lost sight of entirely until Jan. 16, 1880—more than nine years afterwards—when he was found and carefully examined. Limbs equal in length and function. Only the

cicatrix and the hernia remain, the latter an oblique inguinal in the usual site, easily reducible and easily retained, while the former (the cicatrix) is about one-half inch below the anterior superior spinous process. He has not worn a truss for years.

The hernia in this case must unquestionably have been coincidental, and it behaved rather singularly during the progress of the disease for which the boy came under treatment.

This case is interesting in connection with a case presented by Dr. Gouley at a meeting of the State Medical Society of New York in 1875. The hernia in this instance had been treated with a truss, and much annoyance was caused thereby. Dr. Gouley had had the patient under observation for two years prior to the development of the iliac inflammation which was in June, 1873. Abscess formed, and opened spontaneously in August of same year. Relief soon followed, and on February 1, 1874, he was seized again with a recurrence of the former disease, and was operated upon by Dr. G. on February the 27th. An oblong fecal concretion was found at the bottom of the sac. The patient was reported to have swallowed a broken tooth two years before the first attack, but this could not be found. The hernia persisted to a less degree, however, after the cure. The doctor could not explain why a truss should induce the lesion under consideration, unless the appendix should happen to be adherent at or near the internal abdominal ring, or should be included in the contents of the hernial sac. This was not proven, and in his case, as in my own, I am disposed to regard the two as coincidences. Dr. Gouley's case, however, was an adult, and the truss had exerted much pressure. In the one I have reported the pressure was not great.

CASE III.—Male, æt. $4\frac{1}{2}$, was brought into the office of the Hospital Sept. 28, 1876. The pulse was 132, and the temperature $100\frac{3}{4}^{\circ}$; the skin was hot and dry, and there was very marked emaciation. He was constipated, and this had been a prominent feature of the case. The right thigh was flexed at a right angle, and any attempt at extension caused great pain. A distinct tumefaction was seen and felt in the right iliac region, which was very tender on pressure. The present symptoms had existed for about eight or ten days. A diagnosis of perityphlitis was made, and the mother was advised to place the child in the hospital. She felt that she could not bear the separation though, and I referred her to a family physician.

Dec. 28, 1879. Nearly three years later I found the boy, and made a thorough examination, finding nothing save two cicatrices above Poupart's ligament. He was perfect in limb. The mother gave a history as follows: She decided to take the patient to an irregular practitioner, who seemed to have easily recognized the disease, treating it on general principles, *i. e.*, waiting until the abscess had increased to a large size, then using the aspirator. This not giving sufficient vent to the pus, he made an incision, inserting a piece of lint to keep the wound open. A large quantity of fetid pus was evacuated, and the boy soon began to recover. Six weeks from the first symptom he was well, and he has had no sign of relapse up to the present time, nor has there been any sign of hernia. I could not learn whether the doctor found any foreign body within the sac.

CASE IV.—Male, æt. $6\frac{1}{2}$ years, was carried into the office of the Hospital on the morning of the 27th of Oct. 1879, and so tender was the little fellow that his clothing could with great difficulty be removed for examination. He was in perfect health and sound in limb three weeks previously, and, with the exception of a slight attack of malarial fever two years ago, he had been uninterruptedly healthy. He is reported to have had a fall—no one saw him fall—to which his parents attributed the present lameness. His first symptom was pain about the right hip, the night of the day on which he reported his fall; next day he could scarcely walk, and four or five days later medical advice was sought, the surgeon (one in very good standing) pronouncing it hip-disease (so the father stated), and applying a weight and pulley, which had been employed constantly until the twenty-sixth, the day before this visit to the Hospital. During this whole period the patient suffered much pain in the knee and groin, requiring anodynes one or two nights. The condition of his bowels during the first week could not be ascertained. His rectal temperature on this date was $101\frac{3}{4}^{\circ}$. The family history was negative on father's side, neurotic on mother's, *i. e.*, she was insane. The boy was greatly emaciated, and tongue was coated. He was able to stand if assisted, bearing his entire weight on the left limb with the right semiflexed at hip and knee and rotated inward, yet he could not walk at all.

While sitting on the side of the bed he voluntarily crosses the right leg over the left knee, and, as he lies down, there is nothing to be seen abnormal save a lateral deviation of the spinal column in the lumbar region to the left.

In the dorsal decubitus he voluntarily flexes the thigh on the pelvis completely, can abduct and adduct, but cannot extend beyond 90° without pain, and if passive extension be attempted, the boy resists, crying aloud. Rotation can be easily made, if made with care. Nothing can be felt per rectum save a few scybalæ. Pressure over the trochanter in the line of the neck gives no pain, nor does concussion of hip. No infiltration about the trochanter or below Poupart's ligament. A cicatrix of recent vesication is seen over the gluteal region. The abdominal walls are a little retracted, and there is neither tenderness nor infiltration in either ilio-costal space, nor is there any in the left iliac fossa, but in the right tumefaction can be felt distinctly within a triangular area bounded above by a line extending from the top of the crest of the ilium to the median line just below the navel, laterally by the median line and below by Poupart's ligament. There is dulness here and excessive tenderness, but no fluctuation, and no tumour present to the eye.

Perityphlitis is easily diagnosticated, a laxative is ordered, and hot fomentations are applied. His pulse this evening is 148, respiration 30, and temperature 103° .

Oct. 28. Temperature this A. M. $101\frac{3}{4}^{\circ}$, and this P. M. 102° . The laxative of yesterday failed to act, and a mercurial cathartic is administered this afternoon.

29th. A. M. pulse 120, respiration 24, temp. 100° ; P. M. 124, 28, $104\frac{3}{4}^{\circ}$. The tumefaction in the iliac fossa extends over a larger area than on admission, reaching now up to the ilio-costal space. The tenderness is likewise greater, while the flexion of the thigh is in *statu quo*. The bowels have not been moved. A large fly-blister is applied over the indurated region, and remains on eight hours.

30th. The blister drew well, and the vesicated surface is poulticed. The

bowels were moved during the night—first time since his admission. Just before this movement the nurse found in the boy's bed a lumbricoid of medium size and about six inches long. The vital signs this morning are, pulse 140 and temp. 101° ; this evening 140, $100\frac{3}{4}^{\circ}$. Santonine ordered.

31st. Temperature this P. M. $101\frac{1}{2}^{\circ}$. An enema is administered, followed by a large stool, but no worms are found.

Nov. 1. Temperature this morning is $99\frac{3}{4}^{\circ}$; this evening $104\frac{3}{4}^{\circ}$. The poulticing is still continued. From this date to the 5th there was no material change, when hot fomentations were substituted for the poultices.

10th. Convalescing since date of last note. The constipation, however, has been obstinate, and enemata have been resorted to, not always with success. The area of infiltration has very markedly diminished.

11th. Walking without any support, and with very little deformity; indeed, he walks nearly erect. Since the action of the cathartic an iron tonic has been used freely along with stimulants.

16th. As a little induration yet remains in the iliac fossa, a small blister is applied again. Nothing further of interest occurred in the progress of this case, and, on Nov. 22d, the cure was complete. No induration could be detected; the functions of the hip were perfect; the boy had grown stout, and there was no lameness whatever. He was seen and examined again on January 7, 1880, when his condition was as described in preceding note.

CASE V.—Female, æt. 4, came under observation in the Out-door Department Sept. 13, 1880. The thigh was flexed to 90° , and extension resisted by muscular action. There was free movement in flexion and in rotation. The right iliac fossa was filled with a hard tender swelling, and the skin was hot to one's hand. The bowels were constipated. The child first walked lame on the first day of September, and no cause could be assigned therefor. There was very little constitutional disturbance during the first week, but during the second the child became quite feverish, and suffered much from pain. Her temperature was not taken. A diagnosis of perityphlitis was made, and admission to the hospital advised.

Sept. 25. The mother calls with the child to-day, preferring that it be treated, if possible, as an out-patient. The infiltration is the same as at date of last visit, and the condition generally is the same. A fly blister is ordered to be applied to-night, and syrup of the iodide of iron gtt. x t. i. d.

29th. She is admitted to hospital this date at the mother's request. The blistered surface has been poulticed, and now hot fomentations are substituted for the poultices. This was about the only treatment employed, and from this date resolution progressed rapidly.

Oct. 12. There is scarcely any infiltration remaining now, and the child's lameness can with difficulty be detected.

17th. Cure complete, and child gaining flesh daily.

The two cases just reported illustrate the value of blistering in certain stages. In the first one the mass was increasing to an enormous extent, and resolution was promoted, rapidly taking place after a single blister.

CASE VI.—Female, æt. 8, was admitted to the Hospital July 27, 1880, having been suffering for four weeks past with pain in the right loin, getting gradually more lame, losing flesh, etc. Just previous, however, to the beginning of the lameness on right side, she had had a furuncle over the nates on left side. No cause other than a fall, ten days prior to symptoms,

could be found. It was not learned in the history whether she had been constipated or whether there had been any vomiting. It could not be definitely learned when the infiltration first appeared on the right groin. Suffice it to say, when the child was first seen in the Out-door Department, July 24th, three days prior to admission, there was well marked infiltration in the iliac fossa, the skin was hot, and pressure here caused great pain. The child stood with spine in extreme lordosis, pelvis tilted to the right, and thigh flexed; the gait was very awkward, the hand resting upon the knee, and the whole movement reminding one forcibly of the first or second stage of hip-disease. Her pulse on the evening of admission was 120, resp. 32, temp. $102\frac{1}{2}^{\circ}$. In addition to the signs above stated, the examination of the 27th showed an obliteration of the gluteal fold right side, change in the contour of the nates, the angle of deformity of the thigh 90° , resistance to complete flexion and to extension beyond 120° , none to rotation, and a little to complete abduction. There was no joint tenderness whatever. The spinal column was normal.

There could be distinctly seen a small tumour in the right groin, which, on palpation, was found to extend deep into the iliac fossa. It was dull on percussion, excessively tender on pressure, and was non-fluctuating. Perityphlitis was diagnosticated, and fomentations ordered by way of topical treatment, while an iron mixture and cod-liver oil formed the article of internal medication.

There did not seem to be any marked change in the condition of the child other than an increase of the area of infiltration by August 10th, and a blister was ordered. This did not have any effect in promoting resolution, for by August 27th the patient had become quite helpless; abscess had formed, and was pointing just above Poupart's ligament. An incision was made here, giving exit to about one quart of very offensively smelling pus. A tent was inserted, and poultices ordered. Stimulants were resorted to quite freely.

The discharge continued to be quite profuse for a fortnight, yet she began from the day of opening to show signs of improvement. Was walking a little by September 5th, and two weeks later all discharge had ceased, and the wound had closed. The infiltration about the sac continued for a month longer, and her condition October 23d is: a fat, hearty looking girl walking without lameness, able to execute all the functions of the hip-joint. The cure is complete, and only the cicatrix of the incised wound remains to mark the site of a lesion at one time so alarming.

It will be observed that four of these cases were incorrectly diagnosticated, and that all gave signs particularly misleading. One (Case II.) ten years old was diagnosticated as hip-disease at the hospital in view of the history of the fall; yet this fall occurred six months prior to the real beginning of the disease. In view of the influence that traumatism exercises in orthopedic surgery, this was certainly an excusable diagnosis. I can find little record of the signs present, yet there seem to have been enough to warrant this conclusion. Another (Case I.) was regarded by a surgeon of immense experience as one of dislocation of the hip, and he even attempted its reduction under an anæsthetic. A surgeon of equal prominence considered it a strain in the hip-joint, and this too at the end of the third week.

Case III. was probably not examined carefully, but was sent to the hospital for a diagnosis; so also was Case VI. Case IV. was treated for nearly two weeks for hip-disease with weight and pulley, and the diagnosis was made too several days after the invasion of the disease!

In a pretty careful search through the literature of joint-diseases and of perityphlitis I can find very little—scarcely any—prominence given to the differential diagnosis of hip-disease from the disease we are now discussing. All papers upon this subject relate more to the operative aspects of the case, and, as most of the observations have been made upon adults, no necessity has arisen for including osteitis about the coxo-femoral articulation in the list for differential diagnosis.

Some there be, I am well aware, who object to calling the cases whose histories I have recorded in this paper those of perityphlitis, preferring to call them cases of iliac or subfascial abscess. With such I have no quarrel. It is immaterial what name is employed. Only this I have to say, that such a disease as primary uncomplicated perityphlitis is an affection fully recognized by all authorities, and the clinical histories of such cases already on record coincide accurately with those I have just placed on record. That, however, is not the object of this paper. It is simply to clinically illustrate some points in the diagnosis of hip-disease, and to report cases that perhaps might have been reported as hip-disease, had I passed over the question of diagnosis as a mere pathological refinement. The truth is, *pathological refinements are as necessary in orthopedic surgery as in any other specialty.*

Dr. Wm. T. Bull, in an excellent inaugural thesis,¹ says, when speaking of the prognosis: "Resolution may be expected in cases due to exposure to cold, or those following mild attacks of typhlitis," this of course occurring in adults as well as in children.

Dr. Sands, in a recent paper published in the *Annals of the Anatomical and Surgical Society of Brooklyn*, vol. ii. No. 7, 1880, gives a tabulated synopsis of twenty-six cases, and in this I find seven under fifteen years of age, only three of which were operated upon; two terminated in resolution, the abscess in one opened into the bladder and in another into the intestine. In two of my own cases resolution seemed to have been hastened by the application of blisters. M. Bouchut² states that abscess in the iliac fossa is especially rare in children, and he believes that by energetic treatment in an early stage suppuration may be obviated. He further states that if there is a tendency to induration, flying blisters may be applied.

Dr. Whitall, in some closing remarks upon the case of a boy on which he had operated, states: "In the present instance I am far from sure that the operation saved the patient's life; indeed, it is probable that he would

¹ New York Medical Journal, Sept. 1873.

² Am. Journ. Med. Sci., N. S., vol. xl. p. 242.

have recovered had no operation been performed. I am more convinced of this by doubts as to whether the indurated mass had not in a great measure, if not entirely, disappeared by resolution."¹

In a very interesting case of pelvic abscess in a boy *æt.* 12, reported by Dr. Kelsey (who has contributed largely to this subject), operation was postponed until the twenty-second day, and then made through the rectum. The reason for not operating in the usual locality, and this point was raised by Dr. Sabine, was that the pus might be emptied into the peritoneal cavity, inasmuch as the abscess was so deeply situated and carried the peritoneum before it in the ascent.²

Dr. P. B. Purnyea, of New Jersey, reports three cases,³ all of which terminated in resolution under a treatment of blisters and opium. The first was that of a boy *æt.* 13, with a distinct tumour in the right iliac fossa attended with marked constitutional symptoms. Resolution began two days after the application of a blister. Another was that of a young lady, with a tumour in right iliac fossa attended with nausea, vomiting, etc. This had essentially the same treatment, with the exception of opium, as the first case, and, while resolution was slower, the cure was quite as complete. The third was that of a boy *æt.* 14, with a "circumscribed solidification" in right iliac region. This was treated with stupes and opium, but prompt relief did not come until after a blister had been applied.

So much for cases that have done well without operation, and so much for cases that have terminated in resolution. Dr. Sands, who has had a very large experience, states in his last paper, to which reference has already been made, on page 255:—

"The recognition of the class of cases first described (those which terminated in resolution) is important, on account of the erroneous opinion widely entertained, that perityphlitis, when once established, must necessarily proceed to suppuration. While this may, perhaps, be true when the disease is due to perforation of the intestine, with the consequent escape of its contents into the surrounding tissues, it is quite exceptional in those cases which owe their origin to the mere pressure of hard and indigestible substances in the cæcum through the intestinal coats, to the effects of injury, or to causes which, with our present lack of knowledge, we are unable to define, but yet cannot refuse to acknowledge. Such cases, tending to recovery without suppuration, are, as my own experience proves, by no means rare, and their relative frequency is doubtless greater than my figures would seem to indicate, inasmuch as the surgeon is apt to witness the severer, rather than the milder examples of the disease."

On page 256, after questioning the teachings not to delay the incision much beyond the first week of the disease, he states:—

"It must be evident, however, that the question of operation is one that cannot be settled by time alone, and that all the circumstances of the case should be carefully considered before resorting to a procedure which may be needless, and possibly hazardous."

¹ Medical Record, vol. ix. p. 256.

² Am. Journal of the Med. Sci., N. S., vol. lxxvi. p. 84.

³ Medical Record, vol. x. p. 311.

Still further on page 259 :—

“In one remarkable case already mentioned, wherein the affection continued for many months, and ended without suppuration, the combination of symptoms was never such as to demand surgical interference, although on two occasions I was nearly persuaded to undertake an exploratory incision.”

The American literature on this subject is becoming quite extensive, and if one be interested in the surgical aspects, no better papers can be found than those of Dr. Leonard Weber in the *New York Medical Journal* for August, 1871, and the *Medical Record* of January 19, 1878; of Dr. Erskine Mason in the *Medical Record*, vol. xii.; of Dr. Willard Parker, of Dr. Gurdon Buck, of Dr. George Lewis, in the *New York Medical Journal*; and of Dr. Roberts Bartholow and of Dr. Kelsey in the *American Journal of the Medical Sciences*, the former in 1866, the latter in 1878. The object, however, of this paper is to show that—

1. Primary perityphlitis occurring in children presents many of the signs, especially if it be subacute, of hip disease in the first and second stages.

2. Resolution may be brought about, and frequently accelerated, by the judicious employment of vesication.

In conclusion, then, inasmuch as I have conclusively proven by clinical facts and by the testimony of Dr. Sands, given in the form of his large experience, that primary perityphlitis, as a rule, terminates in resolution, may it not be pertinent to inquire whether some cases diagnosticated as hip disease, and treated with such gratifying result, may not have been cases of subfascial, iliac, or perityphlitic inflammation?

ARTICLE XI.

ON A MAGNETIC PROBE FOR THE DETECTION OF IRON MISSILES LODGED IN THE TISSUES. By J. H. BILL, M.D., Surgeon U. S. Army.

DURING the late civil war, from the frequency of lodgment of fragments of shell, canister, and grape-shot, an efficient instrument for the detection in the body of iron and steel missiles, in the midst of a collection of other bodies—as broken bone—became a desideratum, and, since then, the need has been, in the various European wars, still more felt from the use of the very perfect instrument for the detection of leaden bullets given to us by Nélaton.

In imitation of Nélaton's instrument several probes have been proposed for the detection of lodged iron missiles, but it seems to me all lacking simplicity or efficiency or even both these qualities. Such was the probe tipped with ferrocyanide. Such are the several electric probes of Liebreich, McLeod, and perhaps others. The objection to the electric probe lies in the

difficulty of its proper application. Liebreich's probe consists of two slender rods insulated, but bound into one probe. One of these rods is connected with the positive, the other with the negative elements of a battery or electric "pile." The other ends of the rods are free, but as before stated, carefully insulated as regards one another. If now a communication is established between these two free ends, by touching them simultaneously to a conductor of electricity, as a bit of metal, or even wet tissues, a passage is given to the electric current, which is made to manifest itself in an interposed galvanometer. In the first place the arrangement is too efficient. It "goes off" with everything metal, or bone, or flesh—all will serve at times as conductors. In the next place it is difficult to make both poles touch a foreign body at the same time, and to make certain that this has been done. Then a battery is needed, liable to get out of order and always troublesome, and a galvanometer, against which the presentment is stronger even than against the battery. The same objections apply to McLeod's arrangement, consisting as it does of two needles connected with the opposite poles of a battery, which must be thrust into the flesh in whatever direction we guess the foreign body is located, and which, without touching one another, must both touch the fragments of metal.

While considering these instruments, the thought struck me that the simplicity and efficiency they lack may be got by using a permanent magnet as a probe, and developing from it an *induced* current.

When a magnetized bar of steel, covered at one of its ends with a coil of insulated wire, is touched to an iron body, a momentary current of electricity is excited in the coil, and this current will manifest itself if we connect the coil with the proper apparatus. This fact has long been known, but what is to prevent our using it to detect the presence of a fragment of iron or steel imbedded in the tissues of the body? As I was not sure that a coil of wire, wound around a slender steel probe, making a bulb not larger than the bulb of a Nélaton probe, would yield the hoped for results, I made the experiment. The first trial, which I instituted with the aid of Professor Rood, of Columbia College, was perfectly successful, but by his advice I gave up the intention of using a galvanometer, employing instead the audient of a telephone as an indicator.

In this way a bit of steel no larger than a sewing needle manifested itself in the telephone ear-piece by a very audible click.

The magnetic probe, as I propose it, may be made from a very stout knitting-needle six inches long. This is magnetized in the usual way, and then the "centre of greatest attraction" of whichever pole is to be used should be discovered. To do this pierce a disk of cork with a magnetized sewing needle, and float the system on water so that the needle will be vertical. If the north pole of the magnetized knitting-needle is to be employed place the sewing needle in the water, so that its south pole will point to the zenith. The north pole of the probe is now held over the floating needle in a

horizontal position. Presently a spot will be found in the north pole of the probe to which the sewing needle points, and to which, if pushed away, it will invariably return; this is the "centre of greatest attraction," and will usually be found in a magnet six inches long, about one-quarter of an inch from the extremity. The north pole of the probe is now carefully wrapped with about one hundred feet of No. 42 covered copper wire. So that a bulb may be formed three-fourths of an inch to an inch in length, one-fifth to one-quarter of an inch in diameter at its largest part, which should be over the "centre of attraction." At least one-eighth of an inch of the extremity of the north pole is left uncovered. The ends of the wire may now be twisted together, and the spindle-shaped bulb dipped in melted marine glue or asphaltum varnish, and the magnetic probe is made. This is *simple* enough. It is *effective*, for on connecting the ends of the wire with the binding screws of a telephone no difficulty will be found in determining when the uncovered part of the pole of the probe touches iron or steel, whether these are placed on a table or lodged in wet tissues. To satisfy one's self the experiment may be made of touching the probe to other matter, as to copper, zinc, or bone. In this way greater confidence will be secured in the results, and the true sound given by the telephone itself will be easily distinguished from extraneous vagabond sounds.

As the sounds heard are often feeble, or mixed with sounds that we are not considering, it is well to have some arrangement by which the probe and audient can be quickly disconnected, and again quickly connected, without removing the audient from the ear. This may be done by connecting one of the wires of the coil with a spring trigger, which presses against a binding screw of the audient. On forcing the trigger down with the finger the other end is raised off of the binding screw, and the current is interrupted. With this arrangement of the parts we should first get a sound (referable to the telephone), by rubbing the probe against the suspected foreign body, then touching the trigger with the finger of the hand holding the audient we should fail to get a sound by repeating the friction with the probe. If we still get a sound something is wrong about the apparatus, or perhaps we have not closed the other ear tight. After repeating this experiment until these sounds of conduction are eliminated, we try again with the trigger closed, and if we get a true telephonic sound iron *must* have come in contact with the tip of the probe.

No instrument is so simple that we can discard care. Frequently even the Nélaton probe must be examined with a lens, or dipped in nitric acid, before the presence of lead can be settled. So, with the magnetic probe I have described, it may frequently be necessary to make several trials before we can be absolutely sure. I have made many experiments with magnets of different shapes and sizes, assisted by Mr. Stohlmann, of Tiemann & Co., to improve on the instrument first made, but without practical result. If it is desirable to have a larger portion of the pole exposed

than I have advised, the whole magnet must be made shorter, as this throws the "centre of attraction" farther away from the end of the pole. The south pole of the probe should then have a screw cut on it to be connected with a probe of copper or silver by a corresponding screw, so as to make the whole instrument sufficiently long.

I have experimented with double telephones and with a combined telephone and Camman's stethoscope, but without result. In fact the sound given out by a telephone drawn from a magnetic coil is unmistakable, both from its character and position and distinctness. I am still trying, however, to make the audient of the telephone more convenient and efficient for the surgeon's use, but the results (and they relate to the stethoscope as well), if any, must be given in a future paper.

NEW YORK CITY, November 2, 1880.

ARTICLE XII.

THE ANTISEPTIC CATGUT LIGATURE.¹ By LEWIS A. STIMSON, M.D.,
Surgeon to the Presbyterian and Bellevue Hospitals, New York, etc.

MORE than eleven years ago Mr. Lister publicly declared his readiness to apply a catgut ligature to the innominate artery. The statement was intended to express, not his opinion of the ligation of this vessel as a remedial measure, but his confidence in the safety and efficiency of the catgut ligature when applied with all the precautions required, and the safeguards furnished, by his antiseptic method.

Not unnaturally, this confidence was not fully shared by the profession. Men remembered that the use of various animal ligatures, including catgut, had been previously recommended, tried, and abandoned, and they had but little reason to believe that the new method of treating wounds would reverse the judgment contained in this abandonment. Many a novelty full of promise had come to claim their admiration and acceptance only to promptly disappear, barren of all fulfilment, and this new claimant had yet to prove that its fate was not to be the same. Even after this proof had been furnished, and surgeons everywhere were using the spray and carbolyzed gauze, a doubt, founded upon theoretical considerations and supported by one or two accidents, kept them for a time from using the catgut ligature upon the larger vessels. It was feared that the early softening of the ligature would be followed by hemorrhage, and the general feeling was well expressed by a prominent English surgeon when he said that he could sleep much more quietly after an amputation if he knew that he had left a well-twisted piece of silk about the principal artery.

¹ Read before the N. Y. Surgical Society, Dec. 14, 1880.

Little by little the practice has changed. Four years ago Mr. Holmes¹ said that the constant use of the catgut ligature for several years had convinced him that it was far safer than silk, and I presume there is no member of this Society who does not now habitually use catgut to secure all the smaller vessels divided in the course of an operation, even if the wound is not treated antiseptically; and probably more than half of them would not hesitate to apply it to the principal artery of either extremity after an amputation. In short, the general impression is now favourable to its use, and it has seemed desirable to ascertain, if possible, whether this general impression is supported by facts. I therefore ask attention to the results of an examination which has followed two lines, the clinical and the pathological: the first intended to show the relative success of the catgut as compared with the silk ligature; the other to show its local effect upon the vessel to which it has been applied, and thus perhaps to indicate the cause of such difference as might be found to exist.

The class of facts which seemed most suitable to this examination is that furnished by the application of a ligature to an artery in continuity. We already possess numerous statistics showing the proportions in which secondary hemorrhage and gangrene follow the application of a silk ligature to the different vessels, and are therefore provided with a standard of comparison. It is necessary only to obtain similar statistics of the use of the catgut ligature.

The collation of published cases is open to the great objection that it does not include a proper proportion of the unsuccessful ones, and, therefore, I have sought to obtain the integral statistics of certain surgeons, trusting to the fact that such a list would include the entire experience of each contributor to it to compensate for the smallness of the number. The list is of cases furnished, with one exception, by seven members of this society, and presents the experience of only the last three or four years, for it is within that time that the use of catgut has become general here in New York. It includes 29 cases divided as follows:—

Common iliac	.	.	.	.	.	.	.	.	1
External iliac	.	.	.	.	.	.	.	.	3
Femoral	.	.	.	.	.	.	.	.	9
Common carotid	.	.	.	.	.	.	.	.	5
Subclavian, in third part	.	.	.	.	.	.	.	.	3
Brachial	.	.	.	.	.	.	.	.	1
Lingual	.	.	.	.	.	.	.	.	7
									29

All the operations except those on the lingual and brachial arteries were performed for the relief of aneurism, and all the patients except one survived. In no case did secondary hemorrhage occur, and in only one case

¹ Principles and Practice of Surgery, Phila., 1876, p. 120.

gangrene. That was the case of ligature of the common iliac by Prof. Sands for aneurism of the external iliac; pulsation could not be felt in the limb before the operation, and the gangrene was limited to the foot and was dry in character. The fatal case was one of innominate aneurism for which the common carotid and subclavian were simultaneously tied by Dr. Weir. The patient died from rupture of the sac into the trachea on the fifteenth day, but the wounds made at the operation had healed, and the autopsy showed the vessels to be firmly closed, and with no trace of suppuration about the ligature.

Comparing this with the use of silk, what do we find? Mr. Holmes's¹ tabulation of the statistics collected by Drs. Norris and Stephen Smith, gives the following percentages of mortality:—

Subclavian		47.8
Carotid		36.2
Femoral		24.5
External iliac		27.9
Common iliac		78.1

And Agnew² says that fatal secondary hemorrhage took place in 49 of the 300 cases collected by Norris in which the ligature had been applied for aneurism, and in 37 of the 314 similar cases collected for him by Hunter and Griffiths, 32 times in 180 cases collected by Lisfranc, and 73 times in the 530 collected by Porta. Fatal gangrene, according to Agnew, followed 29 times in 222 cases collected by Hunter and Griffiths, and, according to Norris,³ 36 times in 322 cases of ligature of the femoral or iliac arteries.

The difference between these results and those obtained by the use of the catgut ligature is so extreme that it is unnecessary to tabulate them in detail. The rate of mortality in the most favourable (ligature of the femoral), 24.5 per cent., would have given 5 deaths in the 22 cases of my list left after exclusion of the lingual artery. Secondary hemorrhage, varying from 1 in 6 to 1 in 8, would give 2 or 3 cases; and gangrene, 1 in 9, would cause, in the first 13 cases (femoral, common, and external iliaes), at least 1 death.

If the statistics here given of the results of the use of catgut were sufficiently numerous to eliminate the chance of error arising from the possibility that a short series of cases may be exceptionally successful,⁴ it would

¹ A System of Surgery, Art. Aneurism, vol. iii. p. 475.

² Agnew's Surgery, p. 556.

³ Contributions to Surgery, Philadelphia, 1873.

⁴ Corroborative testimony is furnished by the statements of different surgeons, as in the remark quoted above from Mr. Holmes; in that of Dr. Agnew (*loc. cit.*, p. 553), that "this ligature has never yet failed in my hands, even when applied to vessels the size of the external iliac;" in Mr. Bickersteth's 7 successful cases in three years, 5 of the femoral, and 1 each of the common carotid and common iliac; and in Mr. Bryant's list (*Clin. Soc. Trans.*, vol. xi.) of 14 successive applications to the large arteries, with only 2 cases of secondary hemorrhage, in both of which the bleeding was slight and easily controlled by pressure.

scarcely be worth while to look further for proof of the superiority of this ligature, but in view of this possibility and also of some interesting cognate points that appear in the course of the inquiry, I may be permitted to refer to the anatomo-pathological details furnished by specimens from the human subject and by experiment upon animals. These will show, I think, that the probability of secondary hemorrhage is less because occlusion of the vessel is effected, not without its complete division, as has been claimed, but by a purely productive process of tissue formation provoked by the minimum of irritation and unaccompanied by ulceration. Furthermore, as the presence of a blood-clot is not necessary to the safety of the patient under these circumstances, the proximity of a collateral branch does not add to the risk.

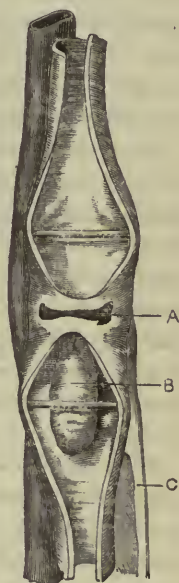
The specimens bearing upon this point are ten in number. The first in order of time is one mentioned by Mr. Holmes.¹ He tied the common carotid and subclavian with catgut; the patient died from another cause eight weeks afterwards. He found "the external coat perfect in both arteries, which were closed by a kind of diaphragm only at the point tied." This, he says, was the first definite anatomical proof that arteries can be occluded at the seat of ligature without being divided.

I do not think the fact that the arteries were found continuous at the autopsy is unquestionable proof that they had not been divided. Mr. Holmes's assertion involves a fact and an inference drawn from it. The fact is that the portions of the artery above and below the ligature were found united by a short fibrous band forming a kind of diaphragm across its lumen. The inference is that this band was composed, in part at least, of the original tissue of the artery included within the loop of the ligature. Is there anything to prove that the tissue contained within the loop had preserved its vitality? I think not. On the contrary, there are reasons for thinking that it has been destroyed and replaced by new tissue. These reasons are of two kinds: similar specimens showing either a different ultimate result on the condition of the parts at an earlier period after ligature, and arguments drawn from the known effect of other ligatures, and also illustrated by a specimen.

I have the specimens from two cases in which Drs. Weir and Little tied the carotid and subclavian simultaneously with catgut. In Dr. Weir's case, which terminated fatally on the 15th day by rupture of the aneurism, the operation wounds had healed almost entirely, and at the time of the autopsy both vessels appeared to be occluded without complete division; the upper and lower portions were continuous, a large fibrous cord uniting them and showing no sign of suppuration. But the change produced by the long preservation of the specimen in alcohol has brought another fact to light. The tissues have shrunk, and we now find that while each vessel is apparently continuous when viewed from behind, they are not so

¹ Principles and Practice of Surgery, Phila., 1876, p. 120.

when viewed from in front. The subclavian has been laid open longitudinally, and it may be seen that it has been divided by the ligature into two portions which are separated one-quarter of an inch from each other, the interval being occupied by an imperfect peripheral fibrous band surrounding an irregularly rounded central cavity which could only have been produced by the falling of the ligature and the tissue embraced in its loop. The fibrous band has had time to form behind and on the side of the ligature, there where the disturbance of the parts was least, and it is lacking in front where the knot and the ends of the ligature lay at the bottom of a wound whose sides had been widely separated. The carotid shows a fibrous cord somewhat thicker than the vessel itself, on the anterior surface of which is an opening as large as the head of a pin. This opening I conceive to correspond to the end of the ligature; and having divided the vessel and the uniting cord longitudinally behind, I found the condition represented by the adjoining figure. A flat transverse slit (A) is exposed extending completely across the course of the vessel, and shut in exteriorly by an investment of the fibrous cord. It is as if a small coin had been placed between the divided ends of the artery and covered in. The middle and inner coats of the upper and lower portions curve inward abruptly as they approach this slit, and form two pouches or culs-de-sac in the proximal one of which lies a firm, brown, ovoid clot (B). These two pouches are separated from each other by the transverse slit, and the portions of the artery are united only by an outer fibrous sheath or capsule which envelops their ends. These two specimens demonstrate the division of the vessel beyond a question. Both ends of the vessel are securely closed; they are imbedded in fibrous tissue, and the wounds had healed over them. Suppose the patient had survived a few weeks longer. Can any one doubt that the ligatures would have become entirely encysted, as has so nearly happened in the case of the carotid, or that they would have become gradually absorbed, giving place to connective tissue which would have filled the gap and thus have furnished such a specimen as Mr. Holmes's, or as the carotid of Dr. Little's?



In Dr. Little's case the patient survived more than three years. The proximal and distal portions of the carotid are united by a short smooth fibrous cord, and narrow gradually to it for about half an inch on each side, so that the vessel has the form of an elongated hour-glass. On the distal side is an adherent clot which extends into and obstructs the internal carotid; on the proximal side is a slender clot lying loose within and much smaller than the lumen of the vessel, and extending from the liga-

ture to the origin of the artery. It is adherent above and below, and the origin of the vessel is occluded by the adhesion of its sides, the result of the pressure of the aneurism.

The subclavian is divided, its distal end being adherent to the anterior surface of the first rib. On the proximal side it ends abruptly within one-eighth of an inch of a collateral branch, and preserves its calibre to the very end. It contains no clot, and the branches of its second portion are pervious.

The remaining specimen is a popliteal artery to which I applied a carbolized silk ligature, cutting both ends short, in the course of an amputation. The patient died several months after the operation, and the ligature is imbedded in a mass of fibrous tissue at the end of the vessel; the latter is patent to within about one-eighth of an inch of the ligature, and contains no clot. Now, from what is known of the effects of ligatures and sutures, there is every reason to believe that the tissues included in the loop of an insoluble ligature are strangulated by the pressure and die, or at least disappear by absorption; therefore, this specimen may be taken to show that such death of this central band of tissue does not involve the casting off of the ligature by suppuration, and to this extent it supports the view here taken concerning the effect of the catgut ligature.

To recapitulate, here are three arteries completely divided by a catgut ligature without suppuration. Two of them present an appearance which indicates that if the patient had survived for a longer time they would have resembled the fourth, in which the continuity of the artery is apparently preserved. Therefore, the fact that arteries examined several months after ligation have presented this apparent continuity is not a proof that they have not been divided. More than that, in the absence of microscopical proof to the contrary, these three specimens must be taken to show that the catgut ligature does, as a rule, divide the artery completely.

This view is in accord with one expressed by Mr. Bryant in a paper contained in the 11th volume of the Clinical Society's Transactions, 1878, and supported by four specimens of which he gives the drawings. The first represents an external iliac artery as it appeared fourteen hours after a catgut ligature had been applied to it with, as Mr. Bryant says, "not more force than I thought sufficient to occlude the vessel." The inner and middle coat are divided entirely, and the external coat in places. The second represents the right common carotid as it appeared twelve days after ligation. It is completely divided and its ends separated (as in the case of Dr. Little's subclavian). The third and fourth represent the subclavian and carotid as they respectively appeared on the thirteenth and nineteenth day after ligation. He says they showed apparently division and repair of the external coat. He mentions also another case, of which he did not show the specimen, in which pyæmia and heart disease

caused death on the fourteenth day after ligation of the femoral artery ; the inner and middle coats were divided, and the external coat ulcerated.

Taking in connection with these cases the fact that slight secondary hemorrhage had occurred in two of the additional ten cases in which he had applied the catgut ligature to large arteries in continuity, Mr. Bryant says, "the conclusion is inevitable that . . . it [the catgut ligature] induces an ulcerative action in the external coat more or less complete." To him, therefore, belongs whatever credit may attach to priority in calling attention to this fact. My own examination, which was made in ignorance of his paper, has only confirmed his opinion, and brought out some additional facts showing an intermediate stage in the process which explains the error to which specimens examined at a later period after the operation have given rise. The two specimens of Dr. Weir's case are, I think, of especial interest and value, since they indicate a general rule more plainly than do Mr. Bryant's.

These specimens show that under some circumstances a clot does not form and extend back to the first collateral branch, a contradiction of what has long been received as a general rule. Why this contradiction, or this exception? And what is the reason of the immunity from secondary hemorrhage in the twenty-nine cases of the list, and especially in that of the subclavian in Dr. Little's specimen, where, as you have seen, the artery ends abruptly in a pouch with a wall but little thicker than that of the vessel, with undiminished calibre, and with a collateral branch close by?

The reason must be sought in the ligature and in its influence upon the tissues, that is, in the less degree of irritation to which it gives rise. While it may be true, as one of the most recent experimenters upon the subject, Raab,¹ has said, that we know but little of the conditions governing the production and growth of a clot, we do know that inflammation or disease affecting the intima of an artery leads to the deposit of a layer, the colourless clot, upon the surface thus affected ; that something more than stagnation of the stream is needed to begin a clot, and something more than its simple presence is required for its growth. In these specimens the distal clots are larger and more generally adherent than the proximal ones ; and I believe it to be generally held, although I know of no statistics upon the subject, that secondary hemorrhage is more common from the distal than from the proximal side of a ligature. It is due to ulceration of the wall adjoining the ligature, and the occurrence of this ulceration on the distal rather than on the proximal side indicates that the process of repair is there less active or less potent, possibly because the vasa vasorum are included in the ligature, and the blood-supply to the wall of the vessel on the distal side is thus interfered with. This diminished

¹ Langenbeck's Archiv, vol. xxiii. 1879.

blood-supply, this irritation more tardily controlled, may explain the greater size of the clot as well as the more marked tendency to ulceration.

By a similar argument, the association of a proximal clot with the silk ligature, and its less size or occasional absence when catgut is used, would be attributed to the greater irritation caused by the former, to its prolonged retention as a foreign body in the wound, and to the associated ulceration, the inflammation extending along the vessel's wall.

In like manner, the absence of secondary hemorrhage when catgut has been used must be due to the less degree of irritation caused by the ligature. The facts relating to this point need only to be mentioned. The silk ligature is treated as a foreign body and thrown off by sloughing of the tissue contained in its loop. An ulcerative process is intentionally set up in the wall of the artery, and it is not strange that it sometimes extends beyond the desired limits. The antiseptic catgut ligature, on the other hand, is applied with the expectation that it will be dissolved, or at least tolerated permanently. Ulceration is not desired or expected, and these specimens show that it does not occur. The traumatism caused by its application results in the production, not of pus, but of new connective tissue which imbeds the ligature and the ends of the artery.

The cases in my list are not sufficiently numerous to warrant any positive conclusions with reference to the relative probability of the occurrence of gangrene. Thirteen cases of ligature of the femoral, external, and common iliac arteries give no deaths and only one case of gangrene of the foot. On the other side, Norris's tables give 322 cases of ligature of the same vessels, with 36 deaths by gangrene, or 1 in 9. We must distinguish between those cases in which a remote portion of the limb perishes by dry gangrene as the result of diminished afflux of blood, and those in which a large portion of the limb is attacked by moist gangrene, one of the factors in the production of which is obstruction to the return venous flow. In the former the occlusion of the artery is the efficient cause, and it can make no difference whether this is effected by a silk or by a catgut ligature; but in the latter there may be something else involved in which the character of the ligature is not without effect. Mr. Syme went so far as to say that injury of the principal vein at the time of the operation was the only cause of gangrene, and, although Mr. Holmes has shown that this statement is too broad, there is yet an important element of truth in it. Injury to the vein acts by exciting phlebitis, and the consequent production of an obstructing clot. But the same phlebitis and the same clot may be caused, when the vein has not been directly injured, by the extension to it of an adjoining inflammation, such as that set up by a ligature. Theoretically, therefore, there is less danger of this complication when catgut is used, because the irritation is less in degree and less prolonged. There is no suppurating focus maintained in proximity to the vein as in the other case.

The ligature itself and its mode of application remain to be considered. We are all familiar with the manner of its preparation and with the fact that its toughness, its resistance to the solvent action of the juices of the body, varies considerably for reasons that are unknown or beyond our control. That fact does not seem to have much importance, for if the wound unites promptly, and the ligature remains undissolved, it will probably become encysted, or if the wound should remain open and suppurate, experience has shown that the undissolved ligature can be safely cast out. So far as I know, this latter course has been taken in only one case, Mr. Oliver Pemberton's,¹ and it cannot be said whether or not it involves more risk than the casting off of a silk ligature in the usual manner.

Mr. Barwell has urged the objection that the strength of the catgut ligature is rendered uneven at different points by its method of preparation. But even if this is so, its strength can be easily tested, and if it is strong enough to bear the strain exerted when the knot is tied, there is no reason to suppose it will break afterwards.

A third objection is that it swells by imbibition, and that this swelling may affect its strength or unduly increase its pressure upon the tissues contained within its loop. The objection, if a real one, is easily met by placing the ligature in carbolized water for a few moments and allowing it to swell before it is applied.

A more important question is whether or not it should be tied with force sufficient to divide the inner and middle coats of the artery. Mr. Barwell thinks, and he has used the ligature successfully, that the coats should not be divided. He draws the knot with just force enough to arrest pulsation beyond it, and, to make the matter more sure, he now uses flat, tape-like ligatures made of longitudinal strips cut from the aorta of an ox.

The theory upon which this modification is recommended is that the pressure of the ligature is sufficient to provoke an adhesive process that will unite the opposed surfaces of the inner wall of the artery and thus obliterate its lumen, and that, as the integrity of the coats is not destroyed, the chance of the occurrence of secondary hemorrhage is less.

That pressure aided by slight irritation is sufficient to cause this adhesion is probable. In Dr. Little's specimen the origin of the carotid is obliterated apparently by the pressure of the aneurism aided by the extension of the irritation of the surface of the latter into the vessel; and in the same specimen the internal jugular is obliterated throughout that part of its course where it is compressed by the aneurism, and there is at the very centre of the junction of that vein and the subclavian a firm bond of union between the anterior and posterior walls about one-eighth of an inch in diameter.

¹ Lancet, Aug. 4, 1877.

But pressure will not always produce adhesion. In Wardrop's famous case, that of Mrs. Denmark, circulation through the carotid was prevented for many months by pressure and ultimately returned. In another case Wardrop placed a ligature of silkworm-gut upon the carotid and obtained primary union of the wound. Three months afterwards the carotid was found to be pervious and presented no trace of the ligature. There are two other cases which bear more directly upon the question. Dr. Peyre Porcher reported¹ a case in which he tied the common carotid with catgut to prevent the impending rupture of an aneurism of the same vessel. He passed the ligature twice around the artery before tying it. Fatal hemorrhage took place from the aneurism on the eighth day. At the autopsy the carotid was found to have recovered its calibre at the point of ligation, and the inner and middle coats were not divided. The second case is one in which the femoral was tied on account of a popliteal aneurism. A large double catgut ligature was used. It is said that pulsation soon returned in the vessel, and that at the autopsy several months later it was found pervious. In the absence of better data, these two cases may be taken to show that the simple presence of a soft catgut ligature is not sufficient to insure the permanent occlusion of an artery. Although in both cases the ligature was tightly drawn, the coats of the vessel were not cut through, and I attribute this to the manner in which the ligature was used, wrapped twice around the artery in one case, and used double in the other, an arrangement which gives it the mechanical characteristics of Mr. Barwell's tape.

The second assertion upon which this modification is based, the alleged integrity of the coats of an artery under a ligature thus applied, is, I think, erroneous whenever the ligature is tough enough to maintain its pressure for a day or two. Theoretically, we should expect the inflammatory swelling of the parts to increase the pressure, and the forced deprivation of blood for twenty-four or forty-eight hours combined with pressure should produce the effect so commonly observed under a suture, the death, total or molecular, of the compressed tissue. Experiment supports this reasoning. I placed around the femoral artery of a dog a large catgut ligature with just force enough to arrest pulsation in a distal branch. The dog was killed a week afterwards, and the ligature was found still upon the vessel imbedded in new tissue that showed no signs of suppuration. The artery, which contained no clot, was divided longitudinally, and presents a complete transverse division at the seat of the ligature, with a small circular loss of substance under the knot.

The practical difficulties in the way of the exact employment of this proposed modification seem to constitute a serious objection to it. If the ligature is soft and promptly absorbed, it is probable that its disappearance

¹ Am. Journ. Med. Sciences, Oct. 1873.

will be followed by the restoration of the lumen of the vessel, since there will be nothing to resist the expansive force of the blood except the soft new connective tissue on the outside, a tissue which experience has amply shown to be insufficient to withstand such a strain. If, on the other hand, it is tough enough to maintain its pressure, the tissue surrounded by it will be strengthened, and the death of the part thus strangulated will destroy the continuity of the wall as completely as if the ligature had been drawn more tightly, while at the same time there will not be the protection against secondary hemorrhage which is furnished in the case of immediate division by the curling in of the divided inner and middle coats. Protection will be given only by a possible clot and the new tissue developed about the ligature, both of which have the same chance of forming in the other case.

The attempts made by Hunter and many other surgeons in the fifty years following his introduction of the proximal ligature in the treatment of aneurism, to obtain occlusion of the vessel without division of its coats, failed to establish the principle, although it furnished many successes, and even led Scarpa, who compressed the artery under a roll of plaster by a flat ligature which was removed on the fourth day, to say that "he considered this improvement in the operation for aneurism as more valuable than all the *bagatelles*, as he was pleased to call them, which he had ever made."¹ Mr. Travers, who gave the subject much study,² condemned the modification of temporary ligatures, after trial, on the grounds "that the security and effect of the ligature are insured by its cutting the internal and middle coats, which it does without damage to the other, however applied; and that retarding the process of ulceration when the ligature has done its duty is not only useless, but mischievous, as it increases the danger of secondary hemorrhage." By the latter phrase he meant that tissues much bruised by the ligature would heal less kindly and promptly than if they had been cleanly divided by it, and would be more likely to suppurate and ulcerate. Now, although the possibility of the occurrence of suppuration is greatly diminished by the antiseptic ligature, it would still, if Travers's reasons are sound, be greater when the artery is merely compressed than when it is partly divided.

Mr. Lister, in one of his earliest papers³ upon this subject, considered this question and expressed his preference for division. He tied the carotid of a calf with catgut and describes the middle coat as being unbroken and unthickened when examined a month afterwards; the inner coat had thickened and occluded the vessel. He says, "the injury done to the vessel by tight tying seems to lead to changes which increase its power of resistance."

I, therefore, believe that we should still prefer the single round cord

¹ Quarterly Journal of Foreign Med. and Surg., No. 1, p. 30. Quoted by Travers.

² Med.-Chirurg. Transactions, 1813-1818.

³ Lancet, April 3, 1869.

applied with sufficient force to divide the middle and inner coats, because it is more certain to accomplish the object of the operation, and because the danger of secondary hemorrhage, sought to be avoided by leaving the coats unbroken, does not appear to be sufficiently great to make it worth while to incur the risk of failure to accomplish the principal object of the operation that is involved in the proposed modification.

ARTICLE XIII.

PSEUDO-POLYPI OF THE COLON; AN ANOMALOUS RESULT OF FOLLICULAR ULCERATION. By Surgeon J. J. WOODWARD, Brevet Lieut.-Colonel U. S. Army, etc. etc.

AMONG the specimens received at the Army Medical Museum after the account of follicular ulceration of the colon in the "Medical History of the War of the Rebellion" had been stereotyped, there are two pieces of colon exhibiting an unusual result of this process of such interest, that, as the case was not reported in the Medical History,¹ the present publication appears desirable.

In the colon from which these pieces were taken the follicular ulcers had enlarged, and adjacent ones had coalesced, until, for more than nine inches, the infiltrated submucosa was laid bare as a raw granulating surface, on which numerous islets of the thickened mucous membrane remained. Subsequently cicatricial contractions commenced in the infiltrated submucosa constricting the margins of the islets of mucous membrane, which were further transformed by hyperplastic inflammatory processes until ultimately they acquired the form of pedunculated excrescences, and projected into the lumen of the intestine like so many little polypi. This lesion must be quite rare, for I find among the records of the post-mortem examinations made during the civil war no description that can be supposed to refer to it, and no like specimen has been received at the Museum; yet the occasional occurrence of similar conditions has not escaped the notice of the pathological anatomists.

Johann Wagner,² in a notable article on dysenteric ulceration, published

¹ Nevertheless the process, of which the specimen about to be described is an illustration, was briefly described by me in the Medical History—*The Medical and Surgical History of the War of the Rebellion, Part II., Vol. I., Medical History, being the second Medical Volume*, Washington, 1879, p. 506—on the authority of Rokitsansky; see next note but one.

² JOHANN WAGNER: *Einige Formen von Darmgeschwüren, iii. Die dysenterische Darmverschwörung*, Med. Jahrb. des k. k. öst. Staates, Bd. xi., 1832, S. 274: "An den Rändern, so wie an den glatten Flecken der Basis jener Vernarbungen erhaben sich hirse- und nadelkopfgrosse, an der Insertion später stielähnlich eingezogene, wie polypöse Wärzchen, welche gleich den gereinigten Flecken, von der den Schleimhaut-

in 1832, described the formation during the healing process of pedunculated polypoid, little warts on the margins of the ulcers and on certain smooth patches on their surface. According to his account both the smooth patches and the warts are coated over with the shining membrane characteristic of cicatrices on mucous surfaces, so that he evidently did not suspect the warts to be really folds of the diseased mucous membrane itself. In size he compared them to pins' heads or millet-seed; they were evidently therefore much smaller than the polypoid excrescences of the Museum specimen.

Carl Rokitsky,¹ in his original paper on the dysenteric process, published in 1839, also described the formation of polypoid excrescences in connection with the cicatrices of dysenteric ulcers, and expressed the opinion that the conditions he observed were identical with those discussed by Wagner; he did not, however, limit the size of the excrescences, as Wagner had done, and he correctly recognized the mode in which they are formed from isolated remnants of the diseased mucous membrane.

narben zukommenden glänzenden Membran überkleidet werden, und der Darmoberfläche daselbst ein fein gefranztes Ansehn mittheilen. Sehr lehrreich weiset diese Veränderungen ein Präparat unsers Museums an mindestens zwanzig linsen-bis thalergrossen Narben im Grimmdarme einer alten Frau nach, welche ein Jahr vorher eine bedeutende Dysenterie glücklich überstand."

¹ CARL ROKITSKY: *Der dysenterische Prozess auf dem Dickdarme und der ihm gleiche am Uterus, vom anatomischen Gesichtspuncte beleuchtet*, same journ., Bd. xxix., 1839, S. 88—describes two methods in which dysenteric ulcers may heal: the first being the usual one, the second that which occurs when the loss of substance is considerable. In the latter case he says stricture of the colon results, a conclusion which, as I have elsewhere shown—see the passage in the Medical History cited in the first note to this paper—the great pathologist also drew probably from his study of a single case. The first or usual method is described in the following words: "Tritt Heilung ein, so hat man zunächst, nachdem die Schleimhaut an den, im niederen Grade erkrankten Stellen auf die unter erwähnte Weise zur Norm zurückgekehrt ist, kleinere Flecken, oder ausgebreitete, buchtig umrandete Strecken vor sich, an denen sie fehlt, an denen somit der submucöse, mattweissliche, infiltrirte Zellstoff bloss zu Tage liegt. Nicht selten bleiben auf diesen Stellen vereinzelte Schleimhautreste wie Inseln zurück. Die blossgelegte submucöse Zellschicht wird nun allmählich—wie Leichenöffnungen aus den verschiedensten Zeiträumen nach abgelaufener Dysenterie lehren—zu einem serösen Gewebe umgewandelt; die Schleimhautbucht an Rande werden gleich den inselförmigen Schleimbautresten, während sich das neue Gewebe zu einem sero-fibrösen verdichtet, zu warzenähnlichen gestielten (polypösen) Verlängerungen zusammen- und hervorgedrängt, wodurch die Ränder ein gefranztes, rundlich gezähntes Ansehen bekommen. Hat sich endlich in Fällen geringeren Substanzverlustes das neue Gewebe so verdichtet, dass es die Schleimhautränder an einander, und an die polypösen Schleimhautreste herangezogen, so findet man als Narbe eine ihrem Umfange nach der Grösse des Statt gehaltenen Substanzverlustes und der Grösse und Anzahl der inmitten desselben zurückgebliebenen Schleimhautinseln entsprechende Stelle, von der sich eine Menge dicht beysammen stehender warziger Schleimhaut-Excrescenzen erhebt, zwischen denen man auf die serös-fibröse Basis, von der sie sich erheben, hineinsieht. Diess sind die Narben, von denen Wagner in seiner Charakteristik der dysenterischen Darmverschwörung in diesen Jahrbüchern, 11 Bd. 2, St. p. 274 spricht."

Both in the paper just cited and in the first edition of his *Handbuch*,¹ Rokitsansky represented the rare condition under consideration as a frequent accompaniment of the healing of dysenteric ulcers, but in the last revised edition of his classical work,² his elaborate description of this anomaly is omitted from the discussion of dysentery, and transferred to his account of the cicatrization of follicular and other ulcers due to chronic catarrhal inflammation of the colon. It seems probable, therefore, notwithstanding the loose language of his earlier publications, that this condition was actually rare even in the experience of Rokitsansky. Indeed, for several reasons, I am strongly inclined to doubt whether either he or Wagner ever encountered more than a single case each. In Wagner's case the cicatrices, about twenty in number, were of moderate dimensions, the largest being of the size of a thaler, and, as Rokitsansky affirmed those seen by him to be similar, it is probable that they also were less extensive than the ulcerated surface in the Museum specimen.

Several other systematic writers on pathological anatomy have repeated, in more or less abbreviated form, the original description of Rokitsansky, but without indicating that they themselves had ever encountered examples of the lesion.³ Merely because it is so rare, therefore, consider-

¹ The Library of the Surgeon General's Office does not yet possess a copy of the original, but I quote from the translation of the Sydenham Society, CARL ROKITANSKY—*A Manual of Pathological Anatomy*, vol. ii., London, 1849, p. 86: "If a cure ensues, the portions of mucous membrane which were affected in a lower degree are first restored to their normal condition; between them are small patches or more extensive spaces, with a sinuous circumference, at which the mucous membrane is deficient, and the submucous, pale, infiltrated cellular tissue is exposed. Not unfrequently we perceive detached remnants of mucous membrane adhering to these parts. The exposed submucous cellular tissue is gradually converted, as proved by cadaveric examinations at the most various periods after the cessation of dysentery, into serous tissue; this is further condensed into sero-fibrous tissue, and by it the sinuous portions of mucous membrane, at the edge of the impaired surface, are, like the isolated remnants of mucous membrane, compressed into warty, pediculated (polypous) prolongations, and thus the originally sinuous circumference obtains a fringed, dentated appearance. In cases in which the loss of substance is inconsiderable, the new tissue may contract so as to bring the edges of the mucous membrane into apposition with one another and with the polypous remnants of mucous membrane, and the cicatrix is then represented by a large number of agminated warty excrescences of the mucous membrane, between which the sero-fibrous basis from which they proceed, may be detected."

² CARL ROKITANSKY: *Lehrbuch der Pathologischen Anatomie*, 3te umgearbeitete Auflage, Bd. III. Wien, 1861. For his description of the cicatrization of the dysenteric ulcer, see S. 209. The old account cited in previous notes is divided between the article on *Catarrhalisch Entzündung*, S. 202-3 and that on *Entzündung und Vereiterung der Drüsen der Dickdarmschleimhaut*, S. 225.

³ Thus for example C. E. BOCK—*Lehrbuch der Path. Anatomie*, 4te Auflage, Leipzig, 1864, S. 420—writes of catarrhal intestinal ulcers. "Die Vernarbung dieser Geschwüre geschieht durch dichtes, meist schwarz pigmentirtes, schrumpfendes Bindegewebe, auf welchem sich die Schleimhautreste in vorspringenden polypenartigen Wülsten und Franzen erheben. Mit dieser Vernarbung ist stets eine Verengung des Darm-

able interest attaches to the Museum specimen, but, as will be seen further on, certain structural details, observed in the study of the histology of the folds of diseased mucous membrane constituting the pseudo-polypi, give it far greater value than the mere fact of its rarity would confer.

The specimen was presented to the Museum by Professor John T. Hodggen of St. Louis, Missouri, who has furnished the following history of the case from which it was taken:—

“The patient was a married woman, forty-four years of age, who had enjoyed very good health, with the exception of an attack of malarial fever, which lasted nearly two years in 1849 and 1850, up to the year 1866, when after an abortion, she was attacked with pelvic cellulitis, and a large quantity of pus formed within the pelvic cavity, which eventually found exit through the rectum. During this sickness, which lasted about three months, she was often so reduced as to render recovery extremely doubtful. I will not go into detail as to treatment, but will say, as soon as her strength would permit, she was sent to the sea-beach, where she remained nearly three months, chiefly at Coney Island. Her recovery with change of climate was rapid and effectual.

“From this on, her health was very good up to April, 1876, when she complained of being troubled with ‘inward piles,’ and had some hemorrhage from the bowels. There was nothing in her condition, however, to excite alarm or even the suspicion of more grave disorder, as some slight medication gave relief. About this time she went to Montgomery Co., Missouri, where some two or three weeks were passed at a sister’s. After her return from the country, about the 31st of May, she and her husband went North and East, visiting several places in the States, on the great lakes and in the British Possessions, spending a week or two in New York and Philadelphia, returning again to St. Louis on the 1st of July, 1876. She had enjoyed herself well, and suffered little from fatigue on the trip. Her physical condition was excellent; she had gained more than twelve pounds, and was looking remarkably well. From July 1st to September the time was passed partly in the city and partly in Montgomery County.

“About the middle of September, she again went East, this time directly

rohrs verbunden, die um so stärker und mit scirrhöser zu verwechseln ist, je mehr die Muscularis und das submucöse Bindegewebe dabei verdicht sind.”

S. O. HABERSHON—*Diseases of the Abdomen*, 2d ed., London, 1862, p. 384—in his chapter on colitis and dysentery, remarks: “In the third stage we find ulceration, sometimes merely as minute circular ulcers, but generally of a more extensive character; the ulcers are often oval in form, and placed in the transverse axis of the intestine, and their edges are raised and injected, irregular and undermined; and their base is formed by the cellular or muscular coats. These ulcerations gradually extend so as to coalesce, till at last nearly the whole of the mucous surface is destroyed, except here and there prominent isolated portions, which become intensely congested, and resemble polypoid growths.”

S. WILKS and W. MOXON—*Lectures on Pathological Anatomy*, 2d ed., London, 1875, p. 416—have confounded this lesion with colitis polyposa—*vide infra*—in a manner which makes it doubtful whether they could be personally acquainted with either condition: “Between the ulcers, the mucous membrane is raised, red, and soft, in the form of so many islands. These may become wonderfully swollen and thickened, while they are still covered with the follicular mucous layer at their summits; they then look like crowds of polypi, and the condition is called *colitis polyposa*.”

to Boston, for the purpose of leaving a son at school, and to accompany a friend in delicate health. She remained about a week or ten days in Boston, and during her sojourn was stricken with a very severe dysentery which was checked by 'Velpéau's diarrhœa mixture,' which had been recommended to her by a cousin. She attributed this dysentery to a 'cold' from having removed her underclothes one warm morning before going out sight-seeing, the wind having changed to the East and the temperature having fallen considerably during the day. After reaching her lodging at night she felt chilly and badly. The dysentery immediately followed, and from this time forward, she never fully regained her health. She afterwards spent some time in New York, a couple of weeks, and about three weeks in Philadelphia, feeling badly, bowels irregular with occasional bloody stools, headache, and colicky pains in bowels, although she did not complain much, and I attributed her haggard and depressed look to excessive exertion and fatigue in her efforts to see the Exhibition. (I was not aware until months afterwards that she had anything like dysenteric discharges while in the Quaker City.) She thought that her sickness in Philadelphia was produced by the dry heat of a Baltimore furnace in the house in which she lodged. Besides headache she complained of frequent griping in the lower part of her abdomen. On the 1st of November she was again in St. Louis. The first weeks were marked by positive improvement in her condition. She was in the habit of spending much time out of doors through the day, but her evenings were generally passed at home in quiet reading.

"About the 15th of December she again commenced complaining; the bloody discharges became more frequent and copious, and continued thus until about four weeks before her demise. Her symptoms did not excite alarm until the 18th of December, when, for the first time, her husband saw the bloody discharges. During her prolonged illness the most remarkable features were the constant bloody discharges, sometimes ten or fifteen, and often very many more, during the twenty-four hours; the quantity passed at a single stool being an ounce or two, sometimes nearly pure blood, then again a bloody, serous, or thin fluid resembling oatmeal and water mixed, and having always a peculiar, to me intensely heavy, sickening smell. Sometimes for days there would hardly be a trace of fecal matter, and then again an occasional fecal discharge, almost, if not quite, normal. She suffered at intervals from griping in the lower part of the abdomen; at times, for days together, she would hardly suffer any, and again sometimes she would suffer almost incessantly; her suffering was greatest generally before the fecal discharges. She was generally cheerful, and always hopeful of ultimate recovery. Her pulse seldom got up to one hundred and twenty, and was never under seventy-eight; the average was about ninety-four. The temperature was not taken very regularly, as she had a keen appreciation of its import; the temperature in the axilla was about 100° F.; never did it exceed 102°. Her appetite was poor, and she was annoyed by constant vomiting, seldom keeping nourishment on the stomach any length of time. This proved an obstinate difficulty, one which resisted all the efforts of the physicians to control, and was the cause of very great anxiety in the selection of her food.

"During the last five months of her illness she suffered little from headache, and retained full consciousness up to about six hours previous to death. She died May 8, 1877.

"The treatment was such as the phases of the disease seemed to indicate. I cannot recall to mind the various remedies, nor their effects as observed;

nor would any good be derived from a narration that would otherwise be tedious. I will state, however, that strict diet—light, easily digested, nutritious articles, and the recumbent position, were among the things most insisted upon. Previous to coming under regular treatment she took a mercurial, ten grains of blue mass, followed by a cathartic, in conjunction with a bitter tonic and quinia. The irritability of the stomach having prevented the internal use of the quinia, a concentrated solution was applied to the skin. The use of quinia was persisted in for months, with short intervals, and certainly with no injurious, and I believe really tonic, effects. When mild aperients failed to do anything towards stopping the excessive discharges from the bowels, injections of warm water were used with soothing effect; opiate pills, opiate suppositories, opium, tannin, and other astringents; on one occasion electricity with a decidedly irritating effect; belladonna and its alkaloid, guarana elixir, strychnia, nux vomica, bismuth, bismuth and charcoal, ergot and its preparations, and many other drugs, were fairly tried with, in many instances, apparent good results for a short time, but only for a short time. For a time no medication whatever was employed, but the strictest attention was paid to her diet. The disease seemed to run its course unmodified until death ensued, which, from the symptoms, seemed to result more from inability to assimilate nourishment than from the direct effect of disease, although, after death, the omentum and other parts were found well supplied with fat.

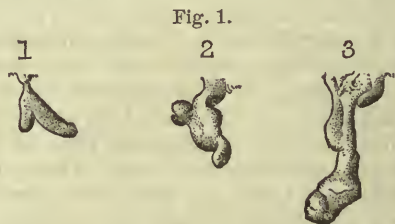
“The body exhibited extreme emaciation. The peritoneum was free from evidences of inflammation, except at the right side of pelvis, where, just at its brim, there were old adhesions, with some recent inflammatory deposit forming adhesions between the right ovary and broad ligament and the head of the colon, where there was a small amount of pus inclosed. The ileum was ulcerated for four inches from the ileo-cæcal valve. The condition of the colon and rectum is illustrated by the specimen.”

It appears from the foregoing narrative, that after an acute attack of dysentery, the patient suffered for seven months from a chronic alvine flux, and finally died with the usual symptoms of follicular ulceration of the large intestine.

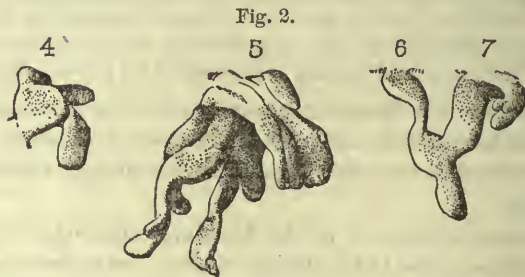
The specimen, as received at the Museum, consisted of two pieces of colon; one of these, No. 1447, Medical Section, taken from the transverse and descending colon, is eight inches and a half long. The upper two inches of this piece exhibits follicular ulceration, considerable thickening of the mucous membrane and submucous connective tissue, together with transverse contraction and consequent diminution of the calibre of the intestine. These lesions agree in every particular with those described and figured in the Medical History,¹ under the heading *Chronic Inflammation accompanied by Follicular or other Ulcers*. Further down in the same piece, however, the ulcers have become much larger, and adjacent ones have coalesced until, in the lower five inches of the piece, the whole circumference of the gut is occupied with a single huge ulcer, on the base of which there are numerous islets of undestroyed mucous membrane. The mucous membrane, of which these islets consist, is even more thick-

¹ See p. 515 *et seq.*, vol. cited in the first note to this paper.

ened than that in the upper part of the piece, and is variously puckered into fantastic forms. Even on examination with the naked eye merely, there can be no doubt of the real nature of these islets, if the upper as well as the lower part of the specimen is considered, although towards the bottom of the piece there are several that might well be taken for genuine polypi, if they were seen by themselves. The most striking of these are represented in the annexed cut (Fig. 1, Nos. 1, 2, and 3).



The second piece, No. 1448, Medical Section, taken from still lower down the colon, is about four inches in length; its whole mucous surface is occupied by a single ulcer, the continuation of that which occupies the greater part of No. 1447. From this surface project thirteen polypoid excrescences; some of them, more or less branched, hang from a single stem like genuine polypi (Fig. 2, Nos. 4 and 5). Others betray that they



are actually folds of mucous membrane by the mode in which they hang by two stems (Fig. 2, Nos. 6, 7). The largest one, in the centre of the piece, is an irregularly triangular islet of mucous membrane, about three-quarters of an inch across, the margins of which are puckered into polypoid forms. The whole piece is represented in the annexed cut (Fig. 3). Its appearance is such that on examination with the unaided eye it might readily be supposed that the general surface between the pseudo-polypi consisted of mucous membrane, but the microscope shows that it is really the submucous connective tissue infiltrated with lymphoid elements—converted, in fact, into a contracting granulation tissue—and that the mucous membrane itself is entirely destroyed, except on the surface of the pseudo-polypi.

The microscopical conditions are well illustrated by a series of cuts (Nos. 7993 to 7997, Microscopical Section), made at the Museum by Dr. J. C. McConnell, by whose skilful hands the illustrations of this paper were drawn. For this purpose one of the pseudo-polypi was selected and removed with a fragment (about one centimetre square) of the intestine to which it was attached. After hardening in absolute alcohol a number of

Fig. 3.



Pseudo-polypi of the colon, No. 1448 Medical Section, Army Medical Museum, natural size.

thin sections were made, stained with carmine, and the most successful mounted in Canada balsam. The pseudo-polypus thus treated was fourteen millimetres long, and approximately cylindrical in shape, the part next the constricted stem being, however, considerably swollen. This swollen portion was four millimetres in diameter, the more slender cylindrical portion two millimetres, and the stem a little more than one millimetre.

Microscopical examination of the thin sections showed that the pseudo-

polypus was composed of a central portion of connective tissue (Fig. 4, *a*), and a peripheral portion consisting of diseased mucous membrane. The central connective tissue was continuous with the submucous connective tissue of the intestine, the mucous membrane forming the peripheral portion extended as far as the stem of the pseudo-polypus, but was missing from the surrounding flat surface of the intestine, where the inflamed submucous connective tissue was completely exposed.

The histological conditions observed in the connective tissue forming the central part of the pseudo-polypus resembled what is ordinarily observed in the submucosa of the colon in those chronic inflammations which are accompanied by much thickening of this coat. The endothelial cells (fixed corpuscles) of the connective tissue were much enlarged, and appeared as rounded or oblong, sometimes even spindle-formed, granular, nucleated cells, twelve to twenty-four micro-millimetres in length, with nuclei eight to ten micro-millimetres in long diameter; the lymph spaces contained everywhere great numbers of lymphoid cells (wandering corpuscles), while the fibrillated matrix was scanty or obscured by the number of the cellular elements. The submucous connective tissue covering the flat surface of the intestine exhibited similar conditions, except that towards the exposed surface the lymphoid elements preponderated, constituting a granulation tissue, in which a rich network of large capillary bloodvessels could be recognized, and in which the commencement of cicatrization was manifested by the presence in places of an abundant fibrillated matrix. The connective tissue trabeculae of the muscular coat of the intestine and the subperitoneal connective tissue were also infiltrated with lymphoid cells, and their endothelial cells were enlarged and granular.

The histological conditions observed in the diseased mucous membrane covering the pseudo-polypus corresponded in many particulars with those that ordinarily occur in chronic inflammations of the mucous membrane of the colon. The columnar epithelium on its surface had entirely disappeared, as is usually the case in specimens of human intestine obtained at autopsies, leaving the surface of the adenoid tissue between the glands of Lieberkühn exposed. By the accumulation of lymphoid elements in this adenoid tissue the glands of Lieberkühn were pushed preternaturally apart, especially at the apex of the pseudo-polypus (Fig. 4, *b*), where the glandular tissue had almost disappeared, and was replaced by a vascular granulation tissue very similar in structure to that which coated the general surface of the intestine.

The glands of Lieberkühn were everywhere greatly elongated (.8 to 1.2 millimetres in length), some of them terminated at their blind extremities in simple clavate pouches, others were bifid, others terminated in four pouches or even more. They had evidently been the seat of an active hyperplastic process which had not merely determined an increase

in length, but caused them to branch dichotomously, precisely as those of them that adjoin the solitary follicles so often do in ordinary subacute and chronic intestinal catarrhs.

In these ordinary catarrhs, as I have shown in the Medical History,¹ the process is limited to the glands adjoining the solitary follicles which are invaded and ultimately replaced by their hyperplastic neighbours; else-

Fig. 4.



Perpendicular cut through a pseudo-polypus of the colon (No. 7997 Microscopical Section; Army Medical Museum). Magnified 10 diameters. *a*. Central connective tissue portion. *b, b*. Submucous connective tissue of the intestine. *c*. Circular muscular coat of the intestine. *d*. Longitudinal muscular coat. *e*. Peritoneum. *f, f*. Two remarkable examples of the ingrowing glands of Lieberkühn; others almost as notable will be observed in other parts of the cut. *g*. One of the pseudo-cystic forms mentioned in the text. *h*. Apex of the pseudo-polypus.

where the overgrowth of the tubular glands is limited by the resistance of the muscle of Brücke, through which in ordinary catarrhs I have never known them to make their way. But under the anomalous conditions that affect the diseased mucous membrane covering our pseudo-polypi, the resistance of the muscle of Brücke appears to have been diminished or overcome, and the ingrowth of the glands of Lieberkühn occurred not

¹ See p. 465 *et seq.*, vol. cited in the first note to this paper.

merely in the vicinity of the closed follicles, but in the intervening parts of the mucous membrane. At frequent intervals glands could be observed that had invaded the submucous connective tissue by their branching terminal pouches, which in extreme cases extended as much as half a millimetre, or even more, beneath the general level of the surrounding cul-de-sacs (Fig. 4, *f, f*). In some places the plane of the cut isolated the lateral branches of these penetrating glands, which appeared then as independent multilocular cysts .4 to .6 of a millimetre in diameter, imbedded in the submucosa just beneath the glandular layer (Fig. 4, *g*); but the real nature of such cystic forms was always betrayed by the columnar epithelium with which they were lined, and their similarity to other lateral branches that still remained connected with the parent glands. In other places the plane of the cut was so related to the axis of the penetrating glands that the outline of their ramifications was handsomely displayed. These penetrating glands appear to have found their way into the lymphatic spaces of the submucous connective tissue, and perhaps the circumstance that some of the glands penetrated so far beneath the general level of the others was determined by the original number and position of the larger lymphatic passages through the muscle of Brücke. Be this as it may, the muscle of Brücke had evidently undergone atrophic changes, for it was not only entirely wanting beneath the penetrating glands, but elsewhere could only be occasionally recognized amidst the swarm of lymphoid elements at the base of the glands.

A branching outgrowth of the terminal cul-de-sacs of the affected glands into the adjoining lymphatic passages, combined with an infiltration of the surrounding connective tissue with lymphoid elements, has now for more than ten years been recognized as one of the characteristic histological features of carcinoma,¹ but a consideration of the structural details of our pseudo-polypi shows that this process can no longer be regarded either as a positive diagnostic characteristic of carcinomatous growths, or as a process in any way peculiar to carcinoma. We see in fact in the intestine under consideration merely the results of a prolonged and intense chronic inflammation. It is impossible to apply the term carcinoma to the specimen without first abstracting from that term all its modern limitations, and going back to the ancient way of regarding every obstinate chronic ulceration as cancerous. That among these evident results of mere chronic inflammation we should observe a process which has been regarded as specific and characteristic of cancer, shows only that this mode of regarding the process is premature and contradicted by the actual facts. If indeed there be any specific histological peculiarities by which carcinoma

¹ For an account of the origin of this view with Thiersch (1865), Waldeyer (1867), and Koester (1869), see my lecture *On the structure of cancerous tumours and the mode in which the adjacent parts are invaded*. The Toner Lectures. Lecture I. Smithsonian Miscellaneous Collections, 266. Washington, 1873.

can be distinguished from the results of chronic inflammation, they must evidently be sought in other details than these.

The condition of the colon described in this paper must be carefully discriminated from the still rarer lesions described and figured by Lebert and Luschka, to which Virchow has applied the designation *colitis polyposa*. In Lebert's case the mucous membrane of the colon was beset with hundreds of little polypi varying in size from that of a lentil to that of a bean, some pedunculated, some sessile. They were composed of a fibroid tissue in which here and there elongated nuclei were imbedded: numerous bloodvessels ramified on their surface, but no glands could be recognized. On the other hand, it is expressly recorded that the glands of the surrounding mucous membrane were normal. The patient was a woman 32 years old, who had suffered for a year from an obstinate diarrhoea.¹ In Luschka's case the polypi are spoken of as existing by thousands from the ileo-cæcal valve to the anus, each square inch having on an average at least twenty-five of them seated upon it. They varied in size from that of a hemp-seed to that of a bean, and the majority of them were distinctly pedunculated, though some of them were sessile. Microscopical examination showed them to consist chiefly of tubular glands resembling the glands of Lieberkühn except that they were longer, and many of them more or less branched. They were held together by a partly fibrillated, partly granular connective tissue, in which naked nuclei as well as nucleated cells were imbedded, and numerous bloodvessels ramified. The mucous membrane of the intestine between the polypi was not visibly altered. The patient was a woman 30 years old, who for years had frequently suffered from bloody diarrhoea.²

Whether the case observed by Menzel in 1720, which Virchow has cited as a third example of *colitis polyposa*, was really of that nature rather than a case of pseudo-polypi similar to those described in this paper, is a

¹ H. LEBERT: *Traité d'Anatomie Pathologique*, tome ii., Paris, 1861, p. 316: "CCCLXXII. Polypes multiples sur tout la surface interne du côlon, épaississement de ses tuniques; pneumonie disséquante du lobe moyen droit.—Diarrhée incoercible, pneumonie gangréneuse.—Mort. (Pl. CXXII. fig. 1 et 2.)"

² H. LUSCHKA: *Ueber polypöse Vegetationen der gesammten Dickdarmschleimhaut*. (Hierzu Taf. iii.), Virchow's Archiv, Bd. xx., 1861, s. 133. The autopsy in this case must have been made very soon after death, for the polypi are described as presenting a well preserved cylindrical epithelium on their surface: "Ihre Oberfläche an den meisten Stellen ein gut erhaltenes *Cylinderepithelium* zeigte," s. 137. At the close of the article the author quotes the description of polypoid excrescences occurring in connection with the cicatrices of dysentery from the first edition of Rokitsansky's Handbuch, see the third note to this paper, and remarks: "In jenem Falle meiner eigenen Beobachtung scheint nur ein geringer Grad der Ruhr gewaltet zu haben, da man nirgends Spuren eines tiefer gedrunghenen Substanzverlustes der Mucosa nachzuweisen im Stande gewesen ist. Die Polypen waren auch nicht an narbigen Stellen eingepflanzt, sondern haben sich vereinzelt an Bezirken erhoben, welche keine augenfällige Veränderung des Schleimhautgewebes zeigten." S. 141.

question which the imperfect description and rude etching in the Berlin Acta¹ do not allow me to decide. Nor have I been fortunate enough to

Fig. 5.

¹ D. MENZEL: *De excrescentiis verrucosocristosis copiose in intestinis crassis dysenteriam passi observatis*, Acta Medicorum Berolinensium, vol. ix., 1721, p. 78, also Fig. 4. The patient was a soldier who died of chronic dysentery. The pathological condition of the intestine is briefly described as follows: "Intestina universa erant inflammata eminenter tamen magis crassa, a quibus omentum totum erat divulsum. Intestinum colon et rectum seorsim, raro spectaculo, magna excrescentiarum verrucosocristosarum copia erant ornata, prout adjecta figura monstrat."

The rude etching thus referred to represents a piece of intestine seven inches long, from which fifteen branching polypoid forms project. These are larger than the pseudo-polypi in the Museum specimen: several of them over an inch in length with as many as seven or eight branches. Some of them appear to have two points of origin from the mucous membrane (like the one represented in Fig. 2, Nos. 6-7, *supra*), which certainly resembles our pseudo-polypi rather than genuine polypi. I have thought it worth while to annex a photo-relief facsimile of Menzel's etching (Fig. 5), to enable the reader to form his own opinion of the probable nature of the lesion represented.

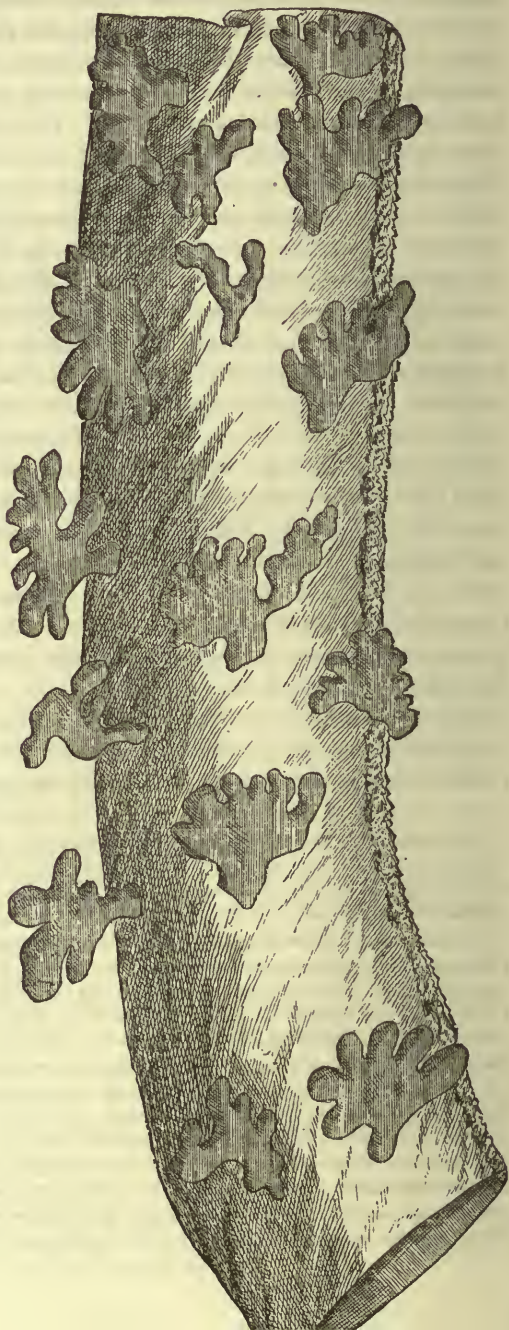


Fig. 5. Fac-simile of the etching illustrating Menzel's paper ("Portio Intestini recti excrescentiarum Verrucosocristosarum plena").

find in literature the details of any other case of genuine colitis polyposa, and as, moreover, I have never seen one myself, I confess to some surprise that Virchow should have applied to it the epithet "common" (gewöhnlichen), even if by that he only intended to indicate that it is more frequent than the condition he has described as colitis cystica polyposa.¹ Certainly I would be well pleased if any of my readers should be able to contribute to the Museum a single specimen illustrative of the lesions described by Lebert and Luschka.

ARTICLE XIV.

LIGATURE OF THE RIGHT SUBCLAVIAN (THIRD DIVISION) AND THE RIGHT COMMON CAROTID ARTERIES, AT A SINGLE OPERATION, ON ACCOUNT OF AORTIC ANEURISM; WITH A CONDENSED HISTORY OF THE DISTAL LIGATURE FOR ANEURISMS NEAR THE HEART. By JOHN A. WYETH, M.D., of New York.

In reporting the following case of the double distal ligature for the relief of an aneurism involving (as diagnosticated) the aorta at the junction of the ascending and transverse segments, I propose to give a succinct history of the Distal Operation in cases of Aneurism near the Heart, from the time when the courageous and immortal Wardrop first performed it in 1825, down to the present date 1880.²

¹ R. VIRCHOW—*Die Krankhaften Geschwülste*, Bd. I., Berlin, 1863, S. 243—after mentioning and giving a figure (Fig. 39) of a preparation of the colon, that exhibits in a striking manner the lesion he describes as colitis cystica polyposa, remarks: "Diese Form ist verschieden von der gewöhnlichen Colitis polyposa, von der Luschka und Lebert Abbildungen geliefert haben, und welche mehr den hyperplastischen Geschwulstformen angehört." On the following page he gives a detailed description of the preparation represented in Fig. 39, from which and the figure, it appears that the lesion illustrated by this remarkable specimen is really the ultimate result of a process, which in a lower degree is common enough in chronic catarrhs of the colon—namely, the invasion of the closed follicles by the adjoining glands of Lieberkühn, the terminal branches of which dilate into cysts. This process I have described in detail in the Medical History (see pp. 323, 465, and 563, vol. cited in the first note to this paper), where I have reported several cases in which the cystic tumours thus formed projected into the lumen of the intestine as little hemispherical tumours one-tenth to one-fourth of an inch in diameter (see p. 512 *et seq.*, *op. cit.*), and pointed out that in a similar case figured by J. CRUVEILHIER—*Anat. Path. du Corps Humain*, t. ii., Paris, 1835-42, Livraison 34, Planches 2 et 3—many of the cysts were pedunculated, so that the case was intermediate in degree between the most advanced of the cases I reported, and the one reported by Virchow, whose specimen, therefore, is rare only in the degree to which the morbid process had progressed.

² In 1781 Pinchienati, an Italian surgeon, amputated a leg below the knee on account of an aneurism above this joint. The tumour became solid, ceased to pulsate, diminished considerably in volume, and the patient was able to use the knee for the support of an artificial leg.

Assalini, in his *Essai medical sur les Vaisseaux lymphatiques*, Turin, 1787, accredits

I shall consider, *First*, those cases in which the carotid and subclavian arteries were both deligated.

Second. Cases in which the carotid alone was tied.

Third. Cases in which the subclavian alone was tied.

Fourth. Cases in which the axillary alone was tied.

SERIES I.—*Ligature of the Carotid and Subclavian Arteries.*

(a) At a single operation (the subclavian in its third division).

(b) With an interval (the subclavian in its third division).

(c) At a single operation (the subclavian in its first division).

(a) CASE I.—*Ligature of the Right Common Carotid and Right Subclavian (third portion), for Aneurism of the Arch of the Aorta (as diagnosed); Recovery.* J. A. Wyeth.—Mary W., from New Jersey, æt. 42, married, mother of one child which died soon after birth. Her father died of dropsy when she was four years of age; her mother died one year and a half later with phthisis. Patient has been in the habit of going on “sprees,” though not habitually addicted to alcohol. Gives no history of syphilis. No rheumatism. Catamenia ceased in April, 1879. Claims fair health (though not robust) until June, 1879, when she strained herself lifting a heavy bookcase, and felt a pain shortly afterward in the region of the right sterno-clavicular articulation. This pain persisted and increased until April, 1880, when she first noticed a slight bulging at the right edge of the sternum in the first intercostal space.

From June to September, 1880, she was treated by perfect rest in the recumbent posture, digitalis, and restricted diet, iron and quinine (and iodide of potassium for a short while). During this period she was attended by my friend Dr. R. M. Cramer (to whom I am indebted for these notes of her condition before I saw her), who, seeing that medical treatment was hopeless, advised her to consult me as to the propriety of surgical interference. For the few weeks just preceding September 14, when she placed herself under my care, the tumour had increased very rapidly in size, and the pain it caused had grown so intense that she had to be kept under the influence of opiates. There was an expansile pulsating tumour projecting from one inch to one inch and a half beyond the level of the sternum through the second right intercostal space. It was oval in shape, and the base of the tumour measured nearly eight inches in circumference. The aneurismal bruit was distinct. The area of dulness extended slightly beyond the base of the tumour, and a little more to the left (in the line of the arch) than upward or to the right. There was at times a slight dif-

Desault as having first advised the ligature of an artery beyond the sac for the cure of aneurism. Broca, *Anévrysmes*, from whom the above is quoted, and who is good authority on this subject, says, however, that the suggestion was due to Brasdor, and that Deschamp, who, Oct. 6, 1798, first practised the *distal ligature* (without amputation) for an aneurism, publicly accredited the invention of the “new method” to Brasdor. In this historic case the patient was sixty years old, and had an enormous aneurism high up in the thigh. Deschamp must have tied the femoral somewhere near Hunter’s canal, for the ligature included not only the femoral artery, but the vein and a part of the *adductor magnus*. The limb became engorged, the tumour grew larger and became painful, and on the fourth day Deschamp opened the sac and, after emptying it, tied the artery above the tumour. Hemorrhage continued and the patient died. This was then a discouraging failure in every respect.

ference in the radial pulses. I thought the left was stronger. Prof. Frank H. Hamilton, and later Prof. Janeway, who saw the patient with me in consultation, agreed in the diagnosis of aneurism of the aorta, at or near the junction of the ascending and transverse portions. I accepted this and thought it very likely that the innominate was slightly involved.

The patient's condition was very unfavourable for a surgical operation. She was pale, had a waxy appearance, ate very little, was emaciated, and had been bed-ridden for several months, and was suffering from intense "shooting pains" through her chest in the direction of the heart and left scapula. I explained to herself and friends her condition, the inevitable and not remote termination of her malady if left as she was, and the great dangers of the only surgical procedure which offered the least hope of relief. She said she would rather die than live in her present state of suffering, and was willing to run the risk of any procedure which offered the least hope of ameliorating her condition.

I then determined to operate, and with the valuable assistance of Drs. E. A. Banks, Paine, Nash U. S. Navy, Cramer, Ayers, M. C. Wyeth, Harris, Jennings, and Albuquerque, on September 21, 1880, I tied the right carotid at the omo-hyoid, and a few minutes later the right subclavian outside the scalenus anticus. The ligature of the carotid required eighteen minutes, that of the subclavian thirteen. The entire operation, including etherization, lasted forty-five minutes.

Barwell's ligatures prepared from the aorta of an ox were used.¹ These were tape-like, strong, and flexible, between an eighth and a quarter of an inch in width, and by their use it is intended to occlude an artery without dividing any of its coats, folding it upon itself at the point of occlusion, and permanently obliterating it by the adhesions which take place both within the vessel and between the foldings of the outer coat. They were drawn tightly until all pulsation ceased beyond the ligature, and were then tied and cut off in the wounds. No more was seen of them after the wounds were washed with a five per cent. carbolic solution and closed with catgut. As far as I have been able to ascertain, this is the first time that Barwell's ligature has been used in this country. In England two carotids, two subclavians (third part), two femorals, and one iliac have been tied with them, and "all have done perfectly well." I am of the opinion that the danger of secondary hemorrhage is greatly obviated by its use, and believe that its introduction will prove of great benefit to surgery. There was no hemorrhage during the operation. The internal jugular

¹ Mr. Richard Barwell, "On Aneurism" (London, 1880), gives the following directions for preparing these ligatures: "Take the aorta of an ox in perfectly fresh condition, peel away the outer cellular coat, and then with a pair of scissors cut spirally round and round a ribbon of the length required [from an eighth to a quarter of an inch wide]. The redundant elasticity is to be eliminated by suspending the cord and hanging a weight to it of from two to four pounds. It dries in about six hours into a horny substance. Any irregularity may be scraped off with a penknife, and the stiff cord stored away in antiseptic gauze until wanted. Fifteen or twenty minutes before the operator is ready to pass the needle, soak the ligature in a three per cent. solution of carbolic acid, and it will become quite soft and easy to tie." I take an aorta a foot long, cut in strips directly in the long axis of the vessel, stretch it one-half its length, and fasten it so with strings until it hardens. Care must be taken not to bend these ligatures while they are hard, as they break and are ruined. In order to pass these large ligatures, I thread the needle with ordinary catgut, and by tying the tape to this, easily draw it beneath the arteries.

vein was distended to about three times its usual size (owing to pressure of the aneurism on the descending cava), and completely overlapped and concealed the carotid.

Several considerable veins crossed beneath the incision going from the median line outward to the jugular. These were kept aside and not divided. The external jugular vein was tied with two threads of catgut and divided between them to expedite the ligature of the subclavian. An enema of whiskey 3j, milk 3ij, was given immediately after the operation. The patient rallied well. There was no appreciable change in the pulsation in the aneurism immediately following the occlusion of the arteries, although it assumed a darker colour within a half hour.

Sept. 22, 9 A. M. Patient rested well during night without anodynes. Tumour very perceptibly diminished, is darker in colour, and pulsates stronger than before operation. Pulsation has returned in right radial, but the impulse is several seconds behind that of the left radial. Pulse 105; temp. 100°. *7 P. M.* Tumour is harder to the feel. Comfortable.

23d. Doing well; pulse 100; temp. 101°.

24th. Temp. 101½°; pulse 98. Patient says she has had "the best night's rest she has had for months." Tumour has sunk almost to a level with the sternum; slight headache; carotid wound suppurating slightly; removed one suture for drainage; quinia and iron; eats fairly well.

26th. Slight pain in right side of head and right arm. She has long been subject to neuralgia of the right side of head and face. No pulsation in right temporal artery. Both wounds discharging slightly.

27th. Pulse 100; temp. 100°. Did not sleep well; slight pain like neuralgia in right temporal.

28th. Pulse 98; temp. 99½°. Comfortable; the "shooting pains," which caused much suffering before the operation, have disappeared.

Oct. 6. Still progressing favourably. She complained of a slight sense of choking during the night, which passed off in a few moments. Tumour is flattening, and area of pulsation seems to be further to the right. The "pains" have not recurred.

21st. Patient sufficiently recovered to travel back to New Jersey in a carriage. Both wounds were discharging a few drops of pus in twenty-four hours. Tumour about same as at last report, except it feels as if its walls were thicker. The sense of expansion is more remote. The deep lancinating pains which necessitated the administration of morphia before the operation are no longer present, and she is comfortable without an anodyne; is still pale, anæmic, and has her old waxy look. To this date, one month after the operation, the improvement in her condition has been as gratifying as surprising. The slow reparative process in the wounds indicates impaired vitality.

Ten weeks after the operation I visited this patient in New Jersey. Since leaving this city she has been under the supervision of Dr. John Van Voorst and his efficient assistant Dr. Jennings, to whom I am indebted for these additional notes.

About Nov. 8th, after using the right arm in arranging her bed (against which exertion she had been cautioned), she had a slight venous hemorrhage from the carotid incision. This was neither profuse nor dangerous, and was arrested by a light compress. The source of this bleeding was one of the small veins which were seen crossing the incision at the time of the operation, and which had been involved in the subsequent ulceration of this wound. Since Oct. 21st she has suffered from several attacks of vomit-

ing, which annoy her for a day or two. Three or four days since she noticed a swollen condition of her feet, which has now almost entirely disappeared. The subclavian wound has entirely healed, as has the incision for the carotid, excepting a small sinus at the lowest portion, which discharges at this late date a few drops of pus in twenty-four hours.

The tumour does not protrude as much as at the time of operation, though it is more prominent than it was five days after the arteries were tied. It is more flattened, is harder to the sense of feeling, and still expansile with the cardiac systole. The area of dulness is smaller. There is no doubt in my mind that solidification by means of laminated fibrinous deposit is progressing slowly and steadily. The pulse in the right temporal is not yet nor has it ever been perceptible since the operation, although the left is easily felt. The right radial pulse is much weaker than the left, and is felt a little after the left. She very rarely feels any pain in the region of the aneurism, from which she suffered intensely and constantly before the operation, and she informed me to-day that she was now and had been a great deal "better off" since I tied the arteries than before.

CASE II. *Aneurism of the Aorta (mistaken for Innominata); Ligature of Right Carotid and Right Subclavian (third portion); Recovery; Death thirteen months later from progress of the Aneurism.* H. B. Sands.—Harriet B., widow, æt. 43, good health until winter of 1866-7, when she began to suffer from pain in right side of head and neck. In January, 1867, noticed slight pulsating tumour just above sternum. Cough, dyspnoea, and dysphagia followed. Tumour at present rises two inches above clavicle, extends from a little to left of median line to clavicular portion right mastoideus. Diagnosis, aneurism of innominata. Dr. Van Buren thought it innominata and root of right carotid. Dr. Austin Flint, Sr., could find no evidence of aortic aneurism. Operation July 16, 1868. July 19th, third day, opened subclavian wound to allow escape of pus. Very decided relief of dyspnoea. 19th day. Carotid ligature came away. 23d. Subclavian ditto. 42d day. Hemorrhage ten ounces from carotid, caused by excitement of intoxication. Recurred on forty-eighth day. Compression was kept up steadily from August 27th to Sept. 10. *Tumour diminished after operation, and visible pulsation ceased.* Contents became somewhat firmer. "The disease evidently remains, but the signs of improvement are unmistakable." Oct. 20. Complains of pain in arm. Nov. 30. Not so well; dyspnoea. Jan. 15, 1869, suffers from pain occasionally in right arm and shoulder. April 1. General condition same; no dyspnoea or dysphagia. April 14. Tumour quite as small as some months ago, but still remains soft and pulsates. July 5. Feels very well, and does light duty in wards. July 20. Increased pain and dyspnoea. Aug. 3. Tumour has increased in size; clavicle rises and falls with its pulsation. Aug. 23. Tumour increasing in transverse diameter; pulsation marked. Became suddenly worse, and died in a few minutes—thirteen months after the operation.

Autopsy.—Aneurism size of a large pear sprang from aorta, just in front of innominata, and was nearly filled with coagulated fibrin. Diameter of sac at origin from aorta one inch by three-eighths; innominata behind tumour, and pressed three or four inches out of its normal position; neither of the three large tumours was involved in the disease. Innominata pervious, subclavian ditto to third portion, which was occluded; carotid closed; atheromatous patches in arch. [Prof. Sands informs me that death was due to pressure of tumour.] (*Med. Record*, Jan. 15 and Dec. 1, 1869; *Bellevue Hospital Records*, 1868-69.)

CASE III. *Aneurism of the Aorta (mistaken for Innominata); Ligature of Right Carotid and Right Subclavian (third part); Death on fifth day from Occlusion of the Aorta by Clot, which projected into this vessel from the Sac.* C. F. Maunder.—John M., æt. 37, commercial tourist, seven years ago successfully treated (by compression) for popliteal aneurism. One year ago pains in right shoulder, head, and neck. Fourteen days before admission (July 9, 1867) he felt pulsation at present site of tumour. Treated two months by absolute rest in bed, lead, opium, digitalis, bromide and iodide of potassium. Operation

Sept. 18, 1867. Subclavian tied before carotid; carbolic dressing. The old pains disappeared after the operation. 19th. Strong pulsation in tumour relieved by venesection. 22d. Great pulsation in tumour; restless; unconscious; cyanosis. 23d. Died, death due to occlusion of ascending aorta by clot.(?)

Autopsy.—Aneurism in position of innominate but arising from transverse aorta to left of origin of this artery. Sac contained very little laminated fibrin, but was almost completely filled with clot, chiefly black. This black clot was continuous with a clot which completely filled the ascending portion of the aorta. Coagulum on the proximal, none on distal side of carotid ligature. Coagulum on either side of the subclavian ligature. Maunder concludes that "coagulation was induced by the operation, and that this coagulation occurred a short time before death." (*Surgery of the Arteries*, by C. F. Maunder, p. 29.)

CASE IV. *Aneurism of Aorta (mistaken for Innominate); Ligature of Right Carotid and Right Subclavian (third part); Recovery with marked Improvement; Death four years after Operation from Rupture of the Sac.* Christopher Heath.—Julia W., æt. 30, had symptoms of aneurism for four months. Nov. 14, 1865. There was a pulsating tumour at inner end of right clavicle, thrusting the bone forward and filling the episternal notch; right radial pulse weaker than left; difficult deglutition; could not assume horizontal position on account of dyspnoea. Nov. 21. Right carotid above omo-hyoid and right subclavian third division tied simultaneously; tumour gradually diminished in size, and it was discovered that there was a perforation in the upper part of the sternum. March 6. Pulsation still present in tumour to a much less degree than formerly, and tumour was much diminished in size. May 15. Tumour has once or twice suddenly increased in size, accompanied by considerable dyspnoea. Nov. 8. Tumour much reduced in size; pulsation less; no bruit; can lie down without distress. Patient died Dec. 8, 1869, four years and seventeen days after operation, from the external bursting of an aortic aneurism.

Autopsy.—Innominate healthy, except somewhat enlarged at its mouth; arch extensively aneurismal; origin right side of ascending aorta; the right and dependent portion of the sac was lined with laminated fibrin one-third of an inch thick; upper portion of sac attached to sternum contained no lumen, only a loose clot; sac had burst through perforation in sternum; carotid and subclavian arteries obliterated. (*Lancet*, Jan. 5, 1867, p. 12, and July 2, 1870, p. 11.)

CASE V. *Aneurism of the Aorta; Ligature of the Right Carotid and the Right Subclavian (third division); Recovery; Temporary Improvement; Death fifteen months after Operation.* Richard Barwell.—John S., æt. 36, father died of heart disease; no history of syphilis or rheumatism. Feb. 8, 1879. Strong pulsation and incomplete dullness over right side upper chest region; pressure on right bronchus, but little air entering right lung; no perceptible or sphygmographic differences between the radial pulses. Since Jan. 9, despite medical treatment, aneurism increased. Feb. 15, 1879. Right carotid was tied just below bifurcation, and at same time right subclavian in third division; recovered well from operation; pressure upon bronchus was to a great extent relieved; condition very satisfactory until March 28, when he became greatly excited by a vexatious domestic trouble. He got into a rage, and was with difficulty dissuaded from leaving the hospital. A day or two after a pulsation further to the left was noticed, which increased until April 15, then became stationary and then declined. May 13. Some increased pulsation perceptible over manubrium and as low as cartilage of second rib; this symptom has, however, much decreased since May 1. "The aneurism for which I tied the vessels is, judging from symptoms, cured, yet the aorta beyond is evidently becoming slowly dilated. June 2. He left the hospital in fairly good condition." After this he spent nearly a year in and out of the hospital. Tumour symptoms on left side of chest slowly increasing. (*Med.-Chir. Trans.*, vol. lxii, and Barwell *On Aneurism*, pp. 113, 116.)

I am much indebted to the distinguished English surgeon who operated on this patient, and whose name is so inseparably associated with the *double distal ligature*, for the following very interesting details of this case not heretofore published:—

"As far as I could judge from symptoms, the man died of simple wearing out. Originally weak, he had led a very dissipated life. The condition of parts about

the thorax was this: *The right carotid*. It was evident that I had tied this vessel too loosely. It was the first I had tied with the ox-aorta ligature, and I purposely tied it more loosely than the other. A slight constriction exists at the place of ligature, and around this, but quite loose, is a loop of what one might take to be some strong fibrous tissue, as a piece of fascia or tendon; in one place this is slightly thickened, probably the site of the knot. *The right subclavian*. On this vessel a more marked constriction exists, surrounded by condensed tissue; the vessel at this place is not the shrivelled cord found after deligation with silk or even with catgut, but is, according to its size (that of a crow-quill), plump, and filled, for about one-third of an inch on the distal or rather more on the proximal side of the ligature, with hard, dry, but still coloured, clot. All the coats of the vessels were evidently intact and uninjured. Collateral circulation was established. The aneurism, about the size of a moderate fist, was *completely filled by firm laminated clot*, and had evidently therefore much decreased, and as evidently must have been very large at the time of operation. The procedure therefore gave the patient fifteen months of life, and, had he been less feeble, would have made him a sound man, as it had certainly cured the disease." Nov. 15, 1880.

The condition of the aneurism and of the ligatured vessels (especially that of the subclavian) goes far towards the demonstration of the propriety of the operation and the safety and efficacy of Mr. Barwell's ox-aorta (tape-like) ligature.

CASE VI. *Aneurism of Aorta (supposed Innominata); Occlusion of Right Carotid by "Constriction" and forty-eight hours later Ligation of the Right Subclavian Artery (third division).*¹ *Death on thirty-fourth day from Rupture of Sac.* S. Fleet Spier.—J. C., æt. 31, clerk. Patient's health good. For nine years slight occasional neuralgic attacks in right temple and some interference with deglutition. Feb. 1874, noticed a pulsating tumour of the size of a small walnut at root of neck. This increased gradually until April, 1874, when it became rapidly larger and pulsated heavily. No dyspnœa. For ten weeks kept quiet in bed, and liq. ferri subsulph. and gallic acid given. Tumour reduced in size one-fifth. Hypodermic needle passed into sac and a small quantity of freshly coagulated blood withdrawn. Aug. 4, 1874, Spier's constrictor was applied to common carotid which was thus obliterated. 5th. Tumour somewhat smaller, less pulsating, and expansile. 6th. Right subclavian tied (third division). 8th. Tumour decreased one-half. 13th. Tumour increased. 25th. Severe pains through base of tumour, increased redness and pulsation, tumour larger. 31st. Blebs on aneurism discharging bloody serum. Sept. 1. Severe hemorrhage from tumour controlled by styptic cotton and pressure. 2d. Severe hemorrhage, numbness in right hand. 3d. Profuse hemorrhage. 4th and 5th. Slight hemorrhage. 7th. Hemorrhage, dyspnœa, died 11 P. M.

Autopsy.—Necrosis of the manubrium, lungs healthy. Liver and right kidney waxy. Aneurism from summit of aortic arch and extends to thyroid cartilage. Clot entirely filled the cavity of sac. Neither the carotid nor innominate was involved. Right common carotid occluded by clots in either side of constriction. External coat not injured, internal divided and invaginated. (*Arch. Clin. Surgery*, Sept. 1876.)

CASE VII. *Aneurism of the Aortic Arch (near the junction of the Ascending and Transverse Segments, as diagnosticated); Ligature of the Right Carotid and the third Division of the Right Subclavian; Recovery, with improvement. (Case still under observation eight months after operation.)*—Henry A. Lediard. George A., æt. 42, carriage cleaner, admitted to Central London Sick Asylum, Feb. 2, 1880, suffering from dyspnœa. Served in "Horse Artillery" for twelve years in various climates; discharged two years ago for heart disease. Beer drinker. No rheumatism; denies syphilis; nothing noteworthy in family history. Protuberance over first intercostal space, close to manubrium sterni on right side; heaving pulsation seen and felt over area size of a teacup; has a

¹ Strictly speaking this case should be classed with those "with an interval" between the two operations; but *practically* it belongs with the simultaneous operations, since the interval was only forty-eight hours. In one of Mr. Barwell's cases which has always been classed with *simultaneous ligatures*, there was an interval of one day.

husky cough; pain in right shoulder and right side of neck; right external jugular vein distended; pupils unequal; right contracted. Radial pulses equal; decubitus left; no dysphagia. Aortic insufficiency; apex beat to left of left nipple, and lower than normal; slight bronchitis and albuminuria. Laryngeal spasms supervened, and death from asphyxia threatening, on March 26, 1880, Lediard tied carotid and subclavian arteries under chloroform. Mr. Barwell's ox-aorta (flat) ligatures were used. Entire operation one hour. In the evening headache and palpitation. Next morning less impulse over aneurism. No pulsation in temporal or radial. Later he had a slight attack of broncho-pneumonia, and two restless nights, with cough and pain, and was in a dangerous condition. Atropia administered; patient perspired profusely. April 1, out of danger. Skin over aneurism less tense. Deep pulsation up right side of neck, as from vertebral. Carotid wound healed by first intention; subclavian suppurated. Ligatures were cut short, and not seen again. Pulsation reappeared in radial and temporal arteries in due course of time, and there was less dulness of the aneurism by April 21, but there was some slight effusion in the right sterno-clavicular joint. Laryngeal symptoms disappeared, and he expressed himself as much relieved by the operation. April 26, aneurism has a more consolidated feeling; murmurs persist. May 1, patient passed from Dr. Lediard's care. May 27, a very severe attack of dyspnoea, lasting two hours, relieved by chloroform and ether inhalation. May 29, ditto, for fifty minutes, relieved as before. June 2, severe palpitation, some dyspnoea, and rise of temperature to 104°. October 15, up and about for four months, enjoying excellent health. During this time he has occasional attacks of palpitation. November 17, 1880. For past week has had lancinating pains beneath shoulder-blade, and the heaving of the upper thoracic walls, which had become almost imperceptible, is now marked. Pulsation strong in the first intercostal space, right side, and this sterno-clavicular joint again distended by effusion. Had a short attack of dyspnoea, of a slight character, a few nights ago—otherwise in good health.—*Notes of Case from Mr. Lediard, of Carlisle, England.*

This interesting case is one of the only three cases in which the aneurism was thought to be in the aorta alone when the operation was performed, viz., Mr. Barwell's, Mr. Lediard's, and my own. It cannot be denied that all these cases obtained relief from the operation.

CASE VIII. Aneurism of Innominate; Ligation of Right Carotid and Right Subclavian (third division); Recovery; Cure? Death from Pleuritis (not connected with the Aneurism) three years and four months after the Operation. J. L. Little.—A. M., æt. 46, ship-carpenter. Addicted to alcohol. No syphilis. While carrying a piece of wood on right shoulder he was overcome by the weight and fell to the ground. Next morning noticed marked change in his voice, which remains. Severe pains in right side of neck, right shoulder and head. In August first noticed a pulsating tumour above and to right of sternum. At time of operation it extended one inch above and one and a half inch to the right of the right sterno-clavicular articulation. Expansile, pulsation well marked; no bruit; hoarseness; paralysis of right vocal cord; trachea displaced to left. May 4, 1877. Operation. Subclavian first tied with carbolized catgut. Syncope ensued when carotid was tied, which passed off in twenty minutes. Good recovery. July 4, discharged. Tumour had undergone but little change and although reduced in size, the pulsation was very distinct. 25th. Readmitted; two days before he was seized with paralysis of left side of body and aphasia. Speech was restored and use of leg so he could walk. Arm still rigid. Tumour perceptibly diminished. Oct. 1878. Tumour has entirely disappeared. On pressure behind sterno-clavicular joint a small pulsating mass is felt. Rigidity of arm still exists. This patient died from pleuritis in no manner connected with the aneurism, in Sept. 1880, three years and four months after the operation.

Autopsy.—The aneurismal tumour, heart-shaped, with transverse and longitudinal diameters of three and one-half inches, and antero-posterior about two and one-half inches, involved the innominate from one-half inch from the origin of this vessel from the aorta, and included in its extension all of the innominate and a

portion of the right carotid and right subclavian. With the exception of a small globular cavity it was filled with a laminated fibrinous clot and was very firm to the touch. Dr. Wm. H. Welch examined the tumour thoroughly, and I am indebted to him for this report. The carotid was obstructed by clot at the point where it left the tumour. There was a blood channel through the tumour out into the branches of the first part of right subclavian. The third part of this artery was closed. Heart was normal, arch of aorta a very little lower than normal but healthy. (Preparation in Wood Museum, Bellevue Hospital, N. Y. *Arch. Clin. Surgery*, Oct. 15, 1878. Orally from Dr. Little.)

CASE IX. Aneurism of Innominate; Ligature of the Right Subclavian and Right Carotid simultaneously; Death on sixth day from Shock. Durham.—Tumour extremely large, extending up the neck so far that carotid could be tied only at upper border of thyroid cartilage. Subclavian was first tied, which was followed by a very marked diminution in the force and fullness of the pulsation; that of the carotid caused no further change. During the short time he survived, the aneurism was noticed to become smaller and more solid. Died on sixth day, apparently from shock. No lesion was found which accounted for death. The innominate was the only artery actually implicated in the aneurism. Its opening into aorta was greatly dilated. (*Lancet*, 1872, vol. ii. pp. 37 and 69.)

CASE X. Aneurism at Root of Neck (most probably Innominate); Ligation of Right Carotid and Right Subclavian Arteries; Death on fifteenth day from Hemorrhage. J. McCarthy.—“The man died on the fifteenth day of hemorrhage from the proximal side of the subclavian ligature.” (*Surgery of the Arteries*, C. F. Maunder, p. 22.)

CASE XI. Aneurism of the Innominate; Simultaneous Ligation of the Right Carotid and Right Subclavian (third division); Death on twenty-sixth day from Hemorrhage from the Sac. Johnson Eliot.—Stanley L., negro, æt. 41. Three years previous there appeared a lump of size of walnut, at sterno-clavicular joint, which remained about three months and then partially disappeared. Two years ago it again increased with marked pulsation. Six months ago it began to increase rapidly in size. Placed in recumbent posture and bromide of potassium given for awhile, but, on account of alarming symptoms, due to rapid growth of tumour, the operation was made Oct. 15, 1876. 16th. Slight cough, ice to tumour at intervals of fifteen minutes. Pulsation slightly diminished. Digitalis, iron, bromide potassium. 18th. Pulsation diminished. 20th. Tumour hardening and pulsation feebler. 21st. Small white bleb on tumour; potassium iodide. 25th. Ulceration commenced in tumour. 27th. Coughs a great deal and expectorates with difficulty; sleeps better; is cheerful. 31st. Walked to water-closet and while there sac ruptured and sixteen ounces of blood were lost. Hemorrhage suppressed by lint compress soaked in Monsell's solution. Death being imminent, sac was injected with same solution 3vj, which had effect of hardening periphery of tumour. Later ʒiiss more were injected. Nov. 2d. Tumour harder, left hospital on a stretcher. Ligature came away from subclavian. 3d. Little bloody serum oozing from sac. 4th. Delirious. 5th. Contents of sac protruding through rupture. 7th. Introduced through opening lint saturated in Monsell's solution. Hemorrhage one pint. 8th. Slight and constant hemorrhage during night. Died on 9th Nov. (twenty-sixth day).

Autopsy.—Floor of transverse arch atheromatous and walls thinned. Opening into innominate two inches in diameter involving left carotid in its expansion. Anterior wall of aneurism developed into a sacculated aneurism; vertical diameter five and three-eighths inches; transverse four inches; antero-posterior three and five-sixteenths inches. Roof of sac absent on account of slough. Sac occluded by concentric laminæ of fibrinous coagula extending into subclavian and carotid arteries. (*Am. Jour. Med. Sci.*, April, 1877, p. 374.)

CASE XII. Aneurism of Innominate (as diagnosed); Ligature of Right Carotid and Right Subclavian (third part); Recovery; very marked Improvement. L. A. Stimson.—Patrick J., æt. 34, labourer, denies syphilis; is dissipated. Ten months previous to March, 1879, he first felt sharp pain in right shoulder, and noticed a lump above right sterno-clavicular articulation. There is a pulsating tumour rising $1\frac{1}{2}$ inch above clavicle and extending 3 inches to the right. Operation January 22, 1880. Carbolyzed catgut; antiseptic dressing; drainage

tube in each wound. Immediate effect was to relieve pain, which returned in ten days, and then finally disappeared. For the first three weeks no change in tumour; then it diminished gradually in size. May 20, 1880. Pulsating tumour somewhat reduced in size since last examination, and can still be readily felt behind the clavicle. (*Amer. Journ. Med. Sci.*, July, 1880, p. 56.)

CASE XIII. *Aneurism of Innominate; Simultaneous Ligation of the Right Common Carotid and the Right Subclavian (third division); Death from Rupture of Sac on fifteenth day.* Robert F. Weir.—Richard P., æt. 45, married, claims he was always healthy; admits eleven years ago that he had a chancre, followed by rheumatism and sore-throat and alopecia; no eruption. For last five years worked in iron mouldings, where he was constantly lifting heavy weights. Christmas, 1875, on getting out of bed was seized with dyspnœa and violent cough. February 1. First noticed pulsating; swelling at root of neck. Admitted to Roosevelt Hospital, May 22, 1876; tumour in right inferior carotid triangle 1 inch above clavicle and $\frac{1}{2}$ inch to right side sterno-clavicular articulation; pulsation strong; no thrill or bruit; trachea pushed to left; pulse in right carotid and right radial weakened; apex right lung consolidated; paralysis right vocal cord; severe paroxysms, dyspnœa, and cough. May 27th, Dr. W. H. Draper, in consultation, concluded that there was expansion of the arch. June 13, 15, and 18. Severe paroxysms of cough and dyspnœa; and on 20th such a severe attack that tracheotomy was necessitated. Death being still imminent from suffocation, on June 22, 1876, Dr. Weir tied the right carotid just above omo-hyoid and right subclavian (third surgical division); carbolized catgut; ether. Pulsation returned in right temporal in two hours, and in right radial in six hours after operation. June 23–25. Better, though occasional paroxysms of coughing; opening in trachea closing up. 27th. Breathing greatly improved. July 4. Numbness in right arm; subclavian wound gaping; cough and dyspnœa. 7th. Aneurism burst into trachea, and patient died in five minutes.

Autopsy.—Aneurism, involving innominate; aorta dilated and atheromatous in ascending and transverse arch; diameter $2\frac{1}{2}$ inches; pleuritic adhesions; lower lobe right lung consolidated; sac is $3\frac{1}{4}$ inches long, with a circumference of $6\frac{1}{2}$ and $7\frac{3}{4}$ inches at its largest portions; opening of innominate into aorta $\frac{2}{3}$ of an inch; firm clots on both sides of both ligatures; sac nearly three-quarters filled with firm clot; posterior and lower fourth empty. [Condensed from notes of case kindly furnished me by Dr. Weir.]

CASE XIV. *Aneurism of the Innominate; Simultaneous Ligation of the Right Carotid and the Right Subclavian (third division);¹ Death on the sixth day from Cerebral Anæmia.* Rossi.—Details not given. After death the left carotid and the right vertebral were found obliterated. "So that during the six days he survived the operation the cerebral circulation had been carried on by the left vertebral alone."² Death was probably due to cerebral anæmia, as no mention is made of hemorrhage, or any cause of fatal result. (*Gazette Méd.*, 1844, p. 58.)

CASE XV. *Aneurism of Innominate; Ligation of Right Carotid and Right Subclavian (third division); Death on sixty-fifth day from Rupture of the Aneurism.* Frederick Ensor.—William S., a Hottentot, æt. 50, drinker, arcus senilis complete in both eyes; perceptible pulsation and aneurismal bruit at right sterno-clavicular region; no bulging. May 29, 1874, put on spare diet. July 1. Pulsation more pronounced. Aug. 8. Upper border of sternum is bulging and veins in neck enlarging. Sept. 8. Operation. 9th. Pulsation less marked, and less pain. 16th. Pulsation much reduced; doing well. Oct. 1. Subclavian ligature

¹ Prof. H. B. Sands, in his article in the *Medical Record*, vol. iii. p. 538, quotes this case incorrectly, as being one in which the subclavian was tied in its first surgical division, i. e., "to the inner side of the origin of the vertebral." The *Gazette Médicale* says: "En dehors du muscle scalene," that is, the third division. In one of my Prize Essays (American Medical Association, 1878) I made the same mistake. Poland, in "Guy's Hospital Reports," vol. xvii. p. 86, commits the same error.

² In Dr. Hutchison's case, "First Prize" Essay (Am. Med. Association, 1878), the only vessel carrying blood to the brain was also the left vertebral, yet there was no cerebral disturbance.

came away. 6th. Carotid ligature came away; progress favourable. Oct. 17. Pulse 80; direct bruit heard over sterno-clavicular region, and pulsation above clavicle marked; no pain. 18th. Right pupil contracted. 20th. Tumour rising in neck; symptoms of pressure on œsophagus and larynx. 24th. Exposed himself to weather, was seized with rigor, and rheumatism supervened. 31st. Cough very troublesome, and after a fit of coughing free hemorrhage from carotid. Nov. 9. Cornea ulcerated; vitreous and lens escaped. 10th. Hemorrhage. 11th. Pulse weak, and intermitting; respiration difficult. 12th. Died, comatose.

Autopsy.—Ascending aorta generally dilated; *semi-solid tumour* of size of small orange formed by innominate; pericardium filled with fluid; inflammation of upper part of right pleura; right subclavian obliterated; aneurism had ruptured just below the carotid ligature; spot on posterior aspect of aneurism “thin as a kid glove.” (*Lancet*, Feb. 6, 1875, p. 192; and July 31, 1875, p. 164.)

CASE XVI. *Aneurism of Innominate; Ligation of the Right Carotid and Right Subclavian (third division); Recovery; Great Improvement.* Richard Barwell. —Catharine H., æt. 27; family history good; although not suffering from any disease has never been strong. In Dec. 1876, had palpitation of heart, breathlessness, and pain in upper part of right chest. March, 1877. Pulsation was noticed above clavicle. She was then treated by rest, and strict diet for two months, and was better for two months; but on resuming her duties as nurse pulsation returned stronger than ever. Jan. 10, 1879. A pulsating tumour presented itself in the neck between the sternal and clavicular origins of the right sterno-mastoid muscle. 17th. Right carotid tied near bifurcation, and right subclavian in third division; progressed well. Feb. 8. During menstruation (as in all subsequent periods) pulsation in tumour was increased. Nov. 5. Quite well; no cough; no dyspnoea; pulsatile tumour perceptible behind the right sterno-mastoid; tumour decreased in size since last examination in April. [Mr. Barwell writes me, August 24, 1880, that the aneurism involved the innominate and to a certain extent the bifurcation.] (Barwell *On Aneurism*, pp. 106, 114, *Med.-Chir. Trans.*, vol. lxii. pp. 217, 218.)

CASE XVII. *Aneurism of Innominate; Ligation of Right Carotid and Right Subclavian (third division); Partial Recovery, with Temporary Improvement; Death from Rupture of a Diverticulum of the Aneurism on the one hundred and eleventh day.* Kilburne King.—Edward C., æt. 37, admitted Oct. 16, 1876, a soldier, and served six years in India; has had syphilis, and is a drinker. From 1871 to 1874 suffered from pressure of knapsack strap across shoulder. In 1874 Mr. Dix treated him by compressing right carotid with a wire compress. Considerable improvement followed this operation for a time, but later he grew worse. Oct. 1876. There is a distinct pulsating tumour extending above right sterno-clavicular articulation; right radial pulse normal; left much diminished in force; decided dulness and loud bruit over a space of 3 inches in diameter (centre of area about right sterno-clavicular joint). Dec. 9. Catgut ligatures on right carotid and third division right subclavian, antiseptically; both tied at once, followed by momentary spasm of facial muscles. From the first the pain was greatly relieved, and gradually disappeared. The tumour soon began to feel firmer; impulse feeble and more circumscribed; cough disappeared. He insisted that he felt better than in years; became insubordinate, and left the hospital on Feb. 24, 1877; was drunk for three days, and came to hospital again on the 27th in bad condition; tumour was larger and red. March 27. Abscess opened at lower part of incision of carotid followed by hemorrhage, which recurring frequently wore him out, and he died. March 30th, 111 days after operation.

Autopsy.—Aneurism of the innominate occupied by firm fibrinous clot, which extended as far as the ligatures on the carotid and subclavian arteries, also a large thoracic aneurism extending nearly to ninth dorsal vertebra. Passing off from root of innominate aneurism was a diverticulum, which communicated with the abscess at the carotid wound, and it was from this that the fatal hemorrhage occurred. (*Lancet*, vol. i., 1878, p. 823.)

CASE XVIII. *Aneurism of Aorta and Innominate; Ligation of Right Carotid and Right Subclavian (third part); Recovery; very great Improvement; Death nineteen months later from Bronchitis.* Richard Barwell.—Laura G., æt. 37, admitted Nov. 20, 1877. Mother died of phthisis. About eight months before admis-

sion she first noticed "a swelling upon the right breast," which during the last two months has rapidly increased; she feels faint when standing, and cannot lie without being propped up by pillows; sleeps only in snatches, being kept awake by cough and sense of suffocation. A projecting tumor with broad base and rounded apex occupies chest between second costal cartilage, and extending up to the episternal notch. It is one inch and three-quarters in transverse diameter, the inner border being one-third of an inch to the left of the right edge of the sternum. It pulsates perceptibly over the chest area and above the sterno-clavicular region. She was treated by diet and rest, but the tumour continuing to increase, on December 6, 1877, the right carotid, close to its bifurcation, and the third part of the right subclavian were tied antiseptically with catgut ligature; ether was employed. By 30th pulsation in tumour was diminished. Jan. 10. menstruating, and pulsation increased in tumour; it was more projecting. March 2. Diminished in size, and signs of progressive solidification, except at menstrual periods, when it increased in size for the time. March 9. Had a fainting fit. May 20. Almost entire disappearance of pulsation. August 26. Left the hospital. No protuberance at seat of aneurism. A distant not expansile pulsation is felt. Feb. 1878. Married. She died in June, 1879, of bronchitis.

Autopsy.—Lungs congested, and in great part solidified; bronchi intensely injected; aneurism was from *anterior aspect of ascending aorta*, near innominate, and from the root of innominate. It measured two and a half inches in the perpendicular, and two transversely. "It consisted entirely of firm, solid blood clot." Right carotid occluded; right subclavian patent as far as removed. [Barwell does not say that it was or was not occluded at seat of ligature, but it probably was impervious.] (Barwell *On Aneurism*, pp. 106–114, and *Med.-Chir. Trans.*, vol. lxii.; Letter from Mr. Barwell.)

CASE XIX. *Aneurism of the Aorta and Innominate (involving also the Origins of the Right Subclavian and Right Carotid Arteries); Ligature of the Carotid; and (twenty-four hours later) of the Right Subclavian Artery (third division); Recovery; Very great Improvement; Death from Broncho-Pneumonia three months and ten days after operation.* Richard Barwell.—Robert W., æt. 45, labourer, admitted July 24, 1877, with above disease. Had suffered from gonorrhœa, and had occasionally drunk to excess; no syphilis. Family history good. Worked in foundry, lifting heavy weights, after leaving the army. In November, 1876, had rheumatism, and in March, 1877, first noticed swelling on right side of neck. Treated with low diet, digitalis, and ice bags to tumour, but it continued to increase. Aug. 14, 1877, Mr. Barwell, under Lister spray, tied right carotid just below bifurcation, tightening ligature before the subclavian was exposed; then ligature passed around right subclavian, third division. On account of venous hemorrhage this ligature was left around the subclavian, and the wound stuffed with lint. Aug. 15. Lint removed under spray, and new ligature passed around subclavian and tightened. The former one, having included a nerve, was not tightened, but left in place. The pulsations in tumour decreased steadily with its dimensions. Oct. 1. No tumour was visible, although a non-expansile lump could be felt by pressing behind either edge of the mastoid muscle. Left hospital Nov. 14. Nov. 20. Returned, suffering with bronchitis and slight pneumonia. Nov. 22. He left in a rage, and died on November 24.

Autopsy showed hypostatic pneumonia and general bronchitis; the tumour, almost entirely filled with laminated clot, had sprung from the junction of the first and second portions of the arch involving the front wall of the innominate and the roots of the right carotid and right subclavian arteries. It was as large as a tennis ball; there was a globular cavity one inch in diameter, communicating with the aorta; innominate, subclavian, and carotid obliterated. (Barwell *On Aneurism*, *Med.-Chir. Trans.*, vol. lxi. pp. 13–32.)

¹ In an article in the number of this Journal for July, 1880, this case is given as one of simultaneous ligation. This is *erroneous*, since the carotid was tied on the 14th, and the subclavian, though exposed, was not tied until the next day, when a new ligature was passed around it and tightened. In this, as in Dr. Speir's case, as far as the effect on the aneurism was concerned (although a few hours elapsed between the occlusion of the two arteries), the operation was *practically* simultaneous.

CASE XX. *Aneurism of Innominate (involving to a slight extent the Aorta); Ligature of the Right Carotid and Right Subclavian (third division); One month later Galvano-Puncture; Sac opened with Knife; Death on fifty-fifth day.* Timothy Holmes.—M., æt. 50. Tumour located chiefly behind manubrium; extends above sterno-clavicular articulation a short distance. Treated by absolute rest and moderate diet without stimulants from April 28 to Nov. 1; no benefit. After this, injection of ergot into tissues around sac, cold, and compression. On Nov. 16, 1871, right carotid and right subclavian (third part) tied simultaneously under Listerism. Tumour at first diminished slightly in pulsation, but soon pulsated again as before operation. December (latter part) sac grew rapidly, and rupture being imminent, galvano-puncture with four needles was made; current applied twenty-five minutes, the direction being reversed every five minutes. For two days after this sac decreased in size, but again increased. Jan. 8, 1872. Seeing the skin whitish and soft, Mr. Holmes punctured the sac deeply with a thin knife; bloody froth and a gush of air escaped. Jan. 10. Died probably from œdema and exhaustion.

Autopsy.—Sac almost filled with coagula firmly adherent, and not in concentric laminæ, involved all of the innominate artery, and opened by a large mouth into aorta; aorta dilated greatly, and atheromatous. The arteries tied were obliterated, although their continuity was unbroken. (*Lancet*, 1872, vol. ii. p. 69.)

CASE XXI. *Aneurism of Innominate and Aorta; Ligature of Right Carotid and Right Subclavian (third division); Death in about fifty days from external bursting of the Sac.* James Lane.—Jane W., æt. 40, married, pulsating swelling size of hen's egg in lower part of neck, on right side. Duration three months. Cough, dyspnœa, and difficult deglutition. Sept. 20, 1871. Tied right carotid and right subclavian (third division) with silk ligature. In three days sac perceptibly less prominent, and pulsation less violent. Forty-six days after operation she left the hospital. After this sac increased in size, and shortly after burst externally. *No autopsy.* [Mr. Holmes thinks this was an aortic aneurism. See *Lancet*, July 20, 1872, p. 69.] (*Lancet*, Jan. 13, 1872, p. 45.)

CASE XXII. *Large Fusiform Dilatation of the Innominate and Aorta (mistaken for "True Aneurism"); Ligature of Right Carotid and Right Subclavian (third division); Death on twelfth day from Exhaustion.* R. M. Hodges.—Male, æt. 55, shoemaker, four years ago, while sawing a heavy piece of timber, was seized by a choking sensation, followed by hemorrhage, one quart. Within six months noticed a swelling in right sterno-clavicular region the size of a hen's egg. Constant cough; pulsating tumour now extends from inner edge of left sterno-mastoid to outer border of right mastoideus. Operation April 11, 1868. No symptoms of note followed, either as to circulation, brain, or respiration. Relief to cough was almost immediate for first three days, then it returned. 16th. The tumour seemed to diminish, and to give the sensation of greater thickness to its walls. 19th. Free hemorrhage from internal jugular vein, which was controlled by ligature. 21st. Cough accompanied by "rusty sputa." 22d. Eleven days after operation patient died, apparently from exhaustion, induced by cough, want of sleep, and the rapidity of the heart's action.

Autopsy.—The aorta was much enlarged and atheromatous. Innominate three times its normal size, but no true aneurism of either of these vessels. Tumour was undoubtedly the distended innominate, pushed off into the neck by the dilated and stiffened aorta. (*Boston Med. and Surg. Journal*, Aug. 6, 1868, p. 6.)

CASE XXIII. *Aneurism of Innominate and Aorta; Ligature of Right Carotid and Right Subclavian (third division); Death on seventh day from Asphyxia.* Joseph Ransohoff.—Frank M., æt. 48, single, labourer. Family history good. Denies alcohol and syphilis. Has had repeated attacks of rheumatism. Three years ago had occasional lancinating pains in right arm and shoulder. One year ago tumour noticed behind right sterno-clavicular articulation. Six months later hoarseness and paroxysms of cough and dyspnœa. Dec. 20, 1878. Paralysis right vocal cord. Tumour firm and elastic, except at sterno-clavicular articulation, where it is soft, and the skin covering it thin and bluish. No thrill. Area of perceptible pulsation two and a half inches in diameter. For one week treated with ergotin hypodermically, and ice bags to tumour constantly for two days. Operation.—January 2, 1879. Right carotid just above omo-hyoid

and right subclavian (third division) were tied with carbolized silk ligatures, cut so as to allow one end to escape from wound. Pulse returned in right temporal in three hours. 3d. Pulse 120; temp. 100°; tinct. digital. gtt. xv, every four hours. 4th. Collapse imminent; digitalis as before, morphia gr. $\frac{1}{4}$ hypodermically. "Pulsations of tumour more limited in area, and diminished in force." 5th. Dyspnœa increasing. 6th. Pulse 120; temp. 101°; alcohol. 7th. Pulse 140. 8th. Worse; temp. 103°; pulse 140. 9th. Died, 3 A. M., from asphyxia.

Autopsy.—Superficial incisions united in great part by first intention, though deep-seated suppuration in the wounds. Both vessels filled with firm coagula. Marked congestion of lungs, lower lobes most consolidated. Fusiform dilatation of arch of aorta, atheromatous generally with patches of calcification. Aneurism two by three inches springing from anterior wall of innominate, which is filled by a large fibrous clot of laminated fibrin, the central portion is occupied by a recent coagulum. (*Am. Journ. Med. Sci.*, Oct. 1880, p. 352.)

CASE XXIV. *Aneurism of Innominate and Aorta; Ligature of Carotid and Subclavian (third division); Death in thirty hours from Asphyxia.* Richard Barwell.—Male, æt. 48. Large aneurism involving arteria innominata, and probably aorta. Dec. 6, 1877. Carotid and third portion of subclavian tied simultaneously. Death in about thirty hours, "the thoracic portion of the aneurism being so large, and the power of respiration so restricted that he never recovered from the ether, but remained cyanosed and epileptoid to the end." [Mr. Barwell writes me, Aug. 24, 1880, that in this case the "aorta was largely involved."] (*Medico-Chirurg. Trans.*, vol. lxii. pp. 217-18.)

(b) CASE XXV. *Aneurism of the Innominate; Ligature of the Right Carotid and the Right Subclavian (third division), with an interval of one year; Recovery, and practically a Cure; Death from Phthisis three years after the last Operation.*¹ A. B. Mott.—Male, æt. 40. Pulsating, expansile swelling behind right sterno-clavicular articulation. The carotid had been tied one year previously (i. e., in 1875) by another surgeon. After this the patient was admitted to Bellevue Hospital, and not being cured, Prof. A. B. Mott tied the subclavian in its third surgical division in 1876. There was no hemorrhage or bad symptom following the operation. Patient recovered, the swelling decreased and hardened, and the aneurism was cured. [I saw this patient with Dr. Mott one year after deligation of the subclavian. A small hard lump about the size of a nutmeg could be felt to rise with the cardiac impulse, no thrill or bruit. The cure was as complete as could be expected. He died of phthisis in 1879. [The preparation is in the Wood Museum Bellevue Hospital, N. Y. It shows an aneurismal dilatation of the innominata throughout its length. The aorta is very little, if at all, dilated. I have examined this specimen very carefully. The innominate is injected with plaster, and is distended by the injection. I am of the opinion that this was a large fusiform dilatation of the innominate (as in Hodges's Case, XXII.), and consider this one of the most successful cases of the double distal operation.] ("Second Prize" Essay, Trans. Am. Med. Association, 1878.)

CASE XXVI.² *Aneurism of the Innominate; Ligature of Right Carotid and, after an interval of two years, of the Right Subclavian (third division); Recovery and Marked Improvement after the first Operation; Ditto after the second; Death from Pleuritis unconnected with the Aneurism sixteen weeks and five days after the Ligature of the Subclavian.* S. W. Fearn.—August 22, 1836. Mary S., æt. 28, five months ago was seized with fit of coughing, and soon after a pulsating swelling appeared above the sternum. There is a round, pulsating tumour immediately above the sternum pressing the trachea to left. Cough, dyspnœa, loud bruit. Right radial pulse indistinct, left normal. She had been treated medically for several weeks without benefit. Aug. 30, 1836. Fearn tied right carotid. Dyspnœa very distressing for a few hours after the operation. Venesection

¹ In *Am. Journal Med. Sci.*, July, 1880, this is given as "an unpublished case," which is a mistake. It is also stated that "as well as can be made out in its present condition, there is no aneurism of the innominate." The innominate is considerably larger than normal.

² First case of double distal ligation.

tion, 3x. Improvement slow and steady. Sept. 27. Dyspnœa has disappeared; patient goes about without difficulty. Tumour still pulsates distinctly, and patient is discharged. July 28, 1838. She returned; has wheezy cough; dyspnœa on walking. When quiescent there is no appearance of former swelling; but by pressing the fingers forcibly behind the sterno-clavicular joint a pulsation is felt and *bruit de souffle* is heard. Aug. 2. Fearn tied right subclavian (third division). 3d. Better than before operation. 4th. Cough troublesome. 12th. Dyspnœa gone and cough much less troublesome. *Bruit* has disappeared. Five weeks after this last operation the patient was doing very well. Could walk a long distance without dyspnœa, and her cough is very slight. In November following she got drunk and fell out of bed three times, injuring her side severely. Pleuritis followed, and she died Nov. 27, 1838, from this disease.

Autopsy.—Pleuritis, with slight solidification of lung. Heart fatty. Inner surface of arch of aorta studded with ossific patches. Innominate alone the seat of aneurism. The sac was an inch and a half in diameter, pressing on trachea one inch above its bifurcation and lessening the calibre of this tube about one-third. Tumour, excepting a channel the usual size of the calibre of the innominate, was filled with dense coagulum. Right carotid obliterated. Subclavian healthy, and divided by ligature. Thyroid axis and branches much enlarged. (*Lancet*, 1836, p. 129; 1838, p. 763; 1839, pp. 33, 437.)

CASE XXVII. *Aneurism of Innominate; Ligature of Right Carotid, and, two months and nine days later, of Right Subclavian (third division); immediate and temporary relief after the first, and same after the Second Operation; Death forty-four days after last Operation from Rupture of the Sac.* W. Wickham.—Richard C., æt. 55, sailor; "free liver" in tropical climate during last nine years. Sept. 17, 1839. Six months previous he noticed a small swelling, size of a hazel-nut, just above right clavicle, about its middle, which disappeared in eight days. From that time until four weeks before admission he had no return of swelling, when he noticed a second tumour, size of hen's egg, at the sternal end of the clavicle. This soon became painful, caused dyspnœa. Sept. 25. Right carotid tied. Sac diminished as soon as ligature was tightened, and pulsated with less force. Cough and dyspnœa relieved. Progressed very favourably to fourteenth day, when ligature came away, and patient allowed to walk about. Left hospital, contrary to advice, at end of third week. Tumour was then same size as immediately after operation, and pulsation same as before. Two months after tying the carotid the rapid growth of the tumour, cough, and dyspnœa forced him to return to hospital. Swelling was twice as large as when he left. Dec. 3. In a condition of almost fatal suffocation, the subclavian was tied in third division. Relief from dyspnœa was so great that patient walked to his bed. Next day he was very comfortable, tumour diminishing, and less force in pulsations. No bad symptoms supervened until Dec. 7, when he was seized with delirium, increase of the aneurism, and violent pulsation of heart and left carotid. Venesection 3xij. From this time the tumour gradually increased. Feb. 7. Left hospital. 15th. Hemorrhage from external bursting of sac. 26th. Death.

Autopsy.—Heart large and fatty. Pulmonary artery, superior cava, enlarged. Aorta extremely dilated from heart to diaphragm; partial calcareous degeneration. Aneurism reached from innominate to upper border of thyroid cartilage. Right carotid and right subclavian obliterated. (*Med-Chir. Trans.*, vol. xxiii. 1840, p. 405.)

CASE XXVIII. *Aneurism of Innominate (involving slightly orifices of Right Carotid and Right Subclavian Arteries); Ligature of the Right Carotid, and, three months later, of Right Subclavian; slight temporary improvement after first Operation; no improvement after second; Death on twenty-first day after last Operation from Rupture of Sac, Erysipelas, etc.* Malgaigne.¹—Male, æt.

¹ This case Mr. Holmes gives as one of ligature of the first part of the axillary. It is difficult to say which it is. The artery was evidently approached from beneath the clavicle, but this bone was pushed up by the growth of the aneurism. I class it here as third part of subclavian for these reasons: (1) Chopelli, who reports the case, says it was the subclavian. (Sappey gives this artery as terminating at the middle of the

46, habitual drinker. July, 1843. Pains in right shoulder and sternal region. Nov. 1843. Slight pulsation, protuberance just above inner fourth of right clavicle. Was bled five times in two months with notable relief each time. Nov. 1844. Severe bronchitis and dyspnœa. Jan. 1845. Admitted to hospital. Tumour large as large hen's egg, pulsating and occupying right sterno-clavicular region and behind manubrium. July, 1845. Right carotid was tied. Tumour diminished slightly in volume and pulsated less forcibly. Left hospital soon after this, and dissipated in alcohol, etc. Tumour grew rapidly larger; dysphagia, dyspnœa almost to suffocation. The site of sterno-clavicular articulation was lost in growth of the aneurism. Distinct bruit. Oct. 17, 1845. Ligature of subclavian near lower border of first rib. Pulsations in sac more pronounced for first three days, afterwards they decreased. Pains in right shoulder and arm persisted. 25th. Incision for ligature opened to allow escape of fetid blood and pus. 29th. Ligature came away. Right arm, which had been partially paralyzed, now improved. 30th. Tumour rising higher in neck. Nov. 1. Dyspnœa severe. 2d. Erysipelas over tumour. Died Nov. 7.

Autopsy.—Sac filled with black clot. Lower portion contained firm, laminated, fibrinous mass, size of an egg, tunnelled by a blood channel three centimetres in diameter. Aneurism had originated from the innominate, involved the upper portion of this vessel, and portions of the right carotid and right subclavian. Right carotid obliterated, subclavian pervious except where it was occluded by ligature. Aorta slightly dilated. Death due to rupture of sac, erysipelas, and suffocation from œdema and pressure of tumour. (*Bull. de la Soc. Anat.*, 1848, vol. xxiii. p. 291.)

CASE XXIX. *Aneurism of Innominate and Aorta; Ligature of the Right Carotid, and, forty-nine days later, of the Right Subclavian (third division); immediate and temporary relief from the first, slight temporary benefit from the last Operation; Death from the Progress of the Aneurism three months after Ligature of Subclavian.* Bickersteth.—J. L., æt. 35, sailor. May 5, 1864. Large pulsating tumour extending to hyoid bone, below second rib; externally to middle right clavicle; internally a little beyond median line; upper portion of sternum absorbed; no bruit. Right and left pulses of equal volume; voice creaking, dyspnœa. May 10. Right carotid was tied above omo-hyoid. Relief immediate, pulsations in aneurism diminished, voice become natural, dyspnœa lessened. Was bled from time to time after operation; ninth day general uneasiness, and pulse in right radial scarcely perceptible; left still strong. Ligature came away thirtieth day. June 28, 1864 (forty-nine days later). Right subclavian (third division) was tied; very considerable diminution in pulsation of tumor followed. Tumour later increased in volume, and the man died three months after the last operation from the progress of the disease. The aneurism involved the innominate and the aorta. (*British Med. Jour.*, July 16, 1864; *Lancet*, 1872, vol. ii. p. 37.)

(c) CASE XXX. *Aneurism of Aorta (mistaken for Innominate); Simultaneous Ligature of the Right Carotid and Right Subclavian, first division;*¹ *Death on sixteenth day from hemorrhage from the Carotid.* Hobart.—Female, æt. 25, 1839. Right carotid tied one inch above its origin. Subclavian between origin of vertebral and the innominate. 14th day. Subclavian ligature came away; the pulsation in tumour had quite disappeared. 16th day. In a fit of anger she threw some books and a pillow at the nurse, and while making these efforts fatal hemorrhage from the carotid ensued.

Autopsy.—Pyriform aneurism sprang from arch of aorta to left of innominate; was filled with a firm coagulum. Subclavian was thoroughly closed. Carotid open, etc. (*Poland, Guy's Hosp. Rep.*, 3d Ser., vol. xvii. p. 86.)

clavicle.) (2) It was in its effects upon the aneurism practically ligature of the third portion, for in about one-half of all subjects there is no branch between this point and the outer border of the scalenus anticus where the ligature is usually placed. The presence here of the posterior scapular branch did not materially influence the result of the distal ligature.

¹ This is the only case of this operation on the distal side of the aneurism to my knowledge.

SERIES II.—*Distal Ligation of the Common Carotid Artery (alone) on account of Aneurism.*

- (a) For aneurism involving the arch of the aorta (alone).
- (b) For aneurism involving the aorta and innominate.
- (c) For aneurism involving the innominate (alone).
- (d) For aneurism involving the innominate, right subclavian or carotid, or both.
- (e) For aneurism involving the carotid (alone).

(a) CASE XXXI. *Aneurism of Arch of Aorta (supposed to have been of the Left Carotid); Ligation Left Carotid; Recovery; Suppuration of Sac and Rupture followed by Improvement; Death four months after operation from pulmonary hemorrhage and purulent pericarditis.* Montgomery.—Negro man, æt. 40; aneurism size of pullet's egg, behind left sterno-clavicular joint. Admitted Feb. 20, 1829. By March 9, had alarmingly increased, extending to outer third of clavicle and up the neck four inches. Dyspnœa, cough, hoarseness, disturbed sleep. Left carotid tied March 9, 1829. 10th. Suffered from dyspnœa, cough, and dysphagia for several hours after operation, but these symptoms are now much abated. 11th. Pulsation in tumour less distinct. 12th. Tumour much smaller and pulsation has ceased. 14th. Aneurism reduced one-half. Slight pulsation in it, in recumbent posture. 18th. Distinct pulsation perceptible at small point on outer edge of aneurism indicating approaching rupture of sac. 20th. Slight hemorrhage from wound. 22d. Short hemorrhage at intervals several times. Aneurism more distended. Tumour gradually enlarged, and on May 29 it burst, discharging eight ounces of fetid chocolate-coloured fluid. 30th. Opening enlarged and eight ounces more of clots and fluid removed. Sac filled with lint. June 9. Aneurism seems to be cured. 13th. Slight purulent discharge from wound, which closed up by 18th. His health improved to July 3, when he was suddenly attacked with cough and expectorated florid blood, 3vj. This continued, and he died from hemorrhage and exhaustion July 11, 1829.

Autopsy.—No vestige of aneurism. Left carotid obliterated throughout its course. An unsuspected aneurism of aorta, size of an orange, was found to spring from arch between origins of left carotid and innominate. Extensive adhesions of lungs. Ten ounces of sero-purulent fluid in pericardium. [Guthrie thinks there "*never was any aneurism of the carotid*," that the aneurism found at autopsy was the same (although much reduced in size), which had extended up the neck and simulated carotid aneurism. "The operation on the carotid gave rise to inflammation which extended to the aorta and aneurismal sac and afterwards along the aorta to the pericardium and heart which in the end destroyed the patient." Broca thinks there was a carotid aneurism. I think with Guthrie that there was none.] (Guthrie, *Diseases and Injuries of Arteries*, p. 190.)

CASE XXXII. *Aneurism of Arch of Aorta; Ligation of the Left Carotid; Recovery; Marked Improvement.* T. Holmes.—Female æt. 21. Disease attributed to rheumatic fever more than a year before operation. Aneurism occupying terminal portions of aortic arch; loud bruit and strong thrill over the upper intercostal spaces. Tuffnell's method, complete rest and restricted diet carried out for several months with marked benefit. On getting up and going about, however, the tumour rapidly increased, distinctly advancing up the left side of the neck. Operation Oct. 21, 1875, followed by great benefit. On second day area and strength of thrill began obviously to diminish, and continued to do so for a month; the first intercostal space which had been bulged out became concave and the symptoms of pressure on the air passages very much relieved. March 10, 1876, very loud bruit, but "patient had evidently derived very great benefit from the operation." [Mr. Holmes writes me (date, Aug. 21, 1880) that he "saw this patient a few days ago. She was then in good general health, much stronger than she had been in early part of this year, and capable of doing a little light work for her living. She is a nurse maid. There is still, however, considerable pulsation and thrill, and loud harsh bruit in the thoracic portion of the aneurism,

but there is no longer any tumour perceptible in the neck. In Feb. or March last she was suddenly taken with paralysis of the left vocal cord and lost the power of speaking to a great extent. This has now entirely passed away and she speaks with perfect intonation.”] (*Brit. Med. Journ.*, April 1, 1876, p. 414.)

CASE XXXIII. *Aneurism of Transverse Aorta; Ligation of the Left Common Carotid; Recovery; Improvement; Death from Diseases of the Liver and Kidneys four months later.* Richard Barwell.—George A., æt. 56. There was pulsation but no bulging of chest wall; suffered from dyspnœa and cough so violent that it threatened strangulation. Left vocal cord paralyzed. Left radial pulse small and weak; right normal. Told patient that operation could not cure, but would probably relieve him and prolong life. Operation Nov. 17, 1877. No bad symptoms followed, wound healed in eight days. Almost from the moment of operation dyspnœa and cough diminished and in ten days ceased altogether. The man could lie down, sleep, and eat well, and lived four months, dying ultimately of kidney and liver disease. (Barwell, *On Aneurism*, p. 104.)

CASE XXXIV. *Aneurism of the Arch of the Aorta (supposed to have been of Left Carotid); Ligation of Left Carotid; Recovery; Death suddenly five months later.* Tillanus.—Male, adult, aneurism above sternum. Diagnosis aneurism of left carotid. Deligation of same. Recovery and diminution of tumour. Five months later died suddenly; cause of death not given.

Autopsy.—Aneurism occupied the arch of the aorta and was completely filled with white coagulum. (Velpéau, *Médecine Opératoire*, 1839, vol. ii. p. 244.)

CASE XXXV.¹ *Aneurism of Arch (supposed of Left Carotid); Ligation of Left Carotid; Recovery; Temporary improvement; Death from Asphyxia, about four months after Operation.* Rigen.—Aneurism on the point of rupture; situated above sternum. Left carotid tied Feb. 21, 1829. Patient more comfortable and tumour diminished considerably. May 9. Operated on for strangulated hernia. Died June 13, “as result of spasm or asthma.”

Autopsy.—Aneurism originated from arch of aorta, between origins of innominate and left carotid; as in case of Tillanus, it was filled with white coagulum, and had considerably diminished. (*Ibid.*)

CASE XXXVI. *Aneurism of the Arch of the Aorta (mistaken for Aneurism of the Carotid and Innominate); Ligation of the Right Carotid; Death on tenth day from Rupture of the Sac in Mediastinum.* O’Shaughnessy.—Male, æt. 42, ship captain; always in good health, excepting some slight sensations of pain in chest, neck, and right arm during last few years. Three months before operation noticed small pulsation; tumour at root of neck of size of pigeon’s egg, located between two origins of right sterno-mastoid. Pulsation in both carotids; the right a little weaker. No pulsation in right radial. Diagnosis as above, and tumour growing rapidly. About years 1840–2, right carotid tied three-quarters of an inch below bifurcation. No immediate change in tumour. Three days later galvano-puncture, which caused tumour to become hard; but it did not diminish. Suffered from annoying cough and general oppression for two days, and died suddenly during a light effort on the tenth day after operation.

Autopsy.—Carotid obliterated above and below the ligature by firm clot. Aneurism developed from arch of aorta, and had ruptured into mediastinum. There were two sacs, one, extending up along right carotid, which contained nothing but brown fluid. The innominate was almost entirely occluded. Galvano-puncture did not induce coagulation. (*Gazette Méd.*, 1843, p. 289.)

CASE XXXVII. *Aneurism of Aorta? (as diagnosticated); Ligation of Right Carotid; Recovery, with marked improvement.* Annandale.—R. B., æt. 62, admitted Aug. 1874. Had symptoms of aneurism for six months previous. Aneurism extended from sternal end of clavicle to cricoid cartilage. Cough and dyspnœa. Iodide of potassium, and rest for one month, when he left hospital somewhat relieved. Returned worse, and on March 2, 1875, right carotid was tied under Lister spray. Immediate effect was to almost stop the aneurismal pulsation, and cause a quivering motion in the sac. Next day greatly relieved. In a week he was out of bed. He no longer felt the pulsation in tumour and the

¹ These two cases were privately communicated to Velpéau by Kerst, of Amsterdam. It is a matter of regret that the details are not given.

pain. The tumour was decidedly smaller. Sept. 27. Health good; no pain, no uneasiness; tumour continued to diminish, and was firmer and flatter. (*Brit. Med. Journ.*, Oct. 30, 1875, p. 550.)

CASE XXXVIII. *Aneurism of the Ascending Aorta; Ligation of the Left Common Carotid; Recovery, with marked and long-continued improvement and relief.* Heath.—Male; operation Feb. 1872; died Sept. 1876, from rupture externally of the aneurismal sac. The relief from the operation had been marked and undoubted. No trace of the catgut ligature, and the coats of the obliterated artery were not divided. (*Brit. Med. Journ.*, Feb. 17, 1877, p. 203.)

(b) CASE XXXIX. *Aneurism of Innominate (and probably ascending Aorta); Ligation of Left Common Carotid; Recovery; Improvement.* N. Pirogoff.—Male, adult; aneurism at sterno-clavicular articulation, extending considerably toward the left. Slight dyspnœa; first sound of heart suspicious; cough. Tied left carotid. In three or four weeks wound was completely healed. From first week after operation breathing improved; no very marked diminution of swelling, which is a little more circumscribed, and pulsates weaker. After six weeks can move around and climb stairs without difficult breathing, which was impossible before operation. In two months and a half patient left hospital. Pulsation is weaker; tumour diminished in size. (*Pirogoff, Grundzüge der Allgemeinen Kriegs-Chirurgie-Leipzig*, 1864, p. 458.)

CASE XL. *Aneurism of Innominate and Arch of Aorta; Ligation of Left Common Carotid; Death third week, result of operation.* N. Pirogoff.—Female, middle-aged; large pulsating tumour in jugular fossa (near clavicle), extending behind the sternum; dyspnœa. Tied left common carotid. In first two weeks no marked alteration in tumour. Third week, hemiplegia supervened, then coma and death.

Autopsy.—Aneurism of the innominate and arch of the aorta completely filled with clot; partial softening in one cerebral hemisphere. (*Ibid.*)

CASE XLI. *Aneurism of Ascending and Transverse Arch of Aorta; Ligation of the Right Carotid; Death on tenth day from operation; Progress of the disease.* Thomas Bryant.—M., æt. 56. Aneurism projected above clavicle, pressed on larynx, and interfered with deglutition and speech. Tufnell's method had been tried. Right carotid tied January 19, 1877, with catgut. From second day he improved, and pulsation in aneurism had much diminished. Did well until ninth day, and died on tenth.

Autopsy.—Enormous dilatation of the ascending and transverse arch. Ligatured artery completely plugged and divided. Left subclavian occluded. Right inguinal vein filled with thrombus. Cause of death not given. No coagulation whatever in the sac. "Operation had done no good." (*Brit. Med. Journ.*, Feb. 17, 1877, p. 204.)

CASE XLII. *Aneurism of Innominata and Arch of Aorta; Ligation of Right Common Carotid; Death on tenth day from Asphyxia due to Pressure of the Aneurism.* Hewson.—John G., sailor, æt. 51, admitted March, 1867; in 1866, he was seized with a severe pain in right ear, and soon after in right shoulder and arm. Four months later he noticed a pulsating tumour in right side of neck, and ten days later a swelling behind the right sterno-clavicular joint. This increased slowly, and three months later cough appeared. Feb. 1867, sight in right eye began to fail; hoarseness; dysphagia; dyspnœa. Pulse in right carotid and right radial weaker than opposite vessels. March 20, 1867, tied right carotid. Local anæsthesia. Internal jugular vein also tied. No immediate effect on tumour. Sight in right eye immediately improved, and pain in eye, ear, and neck absent; that in shoulder persisted. Seven hours after operation great dyspnœa. Tumour much larger and firmer than before. 4th day. Tumour decidedly firmer, and much smaller. Pulsation less perceptible. Better in every respect. 6th day. Two hemorrhages from jugular vein, when the ligature came away. Ceased spontaneously. 8th day. Protrusion of tumour in right first intercostal space. 10th day. Comfortable in morning; afternoon he became livid, dyspnœa, tumour much distended, and he died of asphyxia in the night.

Autopsy.—Sac had eroded sternum and clavicle, involved all innominate and upper wall of arch of aorta; twelve inches in circumference. Pneumogastrics, recurrent laryngeals, and trachea much pressed upon by tumour. Sac filled with

laminated fibrin, and the central lumen, about size of the innominate, occupied by fresh clot; aortic orifice $5\frac{1}{4}$ inches in circumference. Aorta dilated, and studded with calcareous patches. Orifice of left carotid contracted. Lungs full of frothy serum, and at points solidified. (*Penna. Hosp. Reports*, 1868, p. 219.)

CASE XLIII. *Aneurism of Aorta, Innominate, Root of Right Carotid, and Right Subclavian Arteries; Ligature of the Right Carotid (and supposed Ligature of the Right Subclavian, third division); Death from Continued Increase of the Tumour and Suffocation, forty-one days after Operation.* Hutchison.—Richard M., æt. 48, found lying in street suffering from dyspnœa and partial insensibility, Dec. 13, 1866. Five months ago began to suffer from dyspnœa, and noticed a swelling at right sterno-clavicular articulation. Before this time his health had been good. Tumour gradually increased; pulsates strongly; bruit, and cough. Treated by rest in bed, digitalis, periodical venesection, low diet for one month, but symptoms became more grave, and January 16, 1866, tied right carotid after dividing completely both heads of the sterno-mastoid. 17th. Had a more comfortable night than for several weeks before. 28th. Breathes quietly, and has been very comfortable since the operation, except continuation of pain, and numbness in right arm, which he had a long time before the operation. Feb. 25. Since Feb. 7th has had slight erysipelas of the right side of neck and face, and for two or three days has suffered from paroxysms of dyspnœa. Feb. 26. Died from suffocation.

Autopsy.—Aneurism involved arch, innominate, and orifices of right carotid and right subclavian. Sac nearly filled with concentric layers of fibrin. Orifices of right and left carotids and right subclavian firmly closed by clot. Clot in right subclavian extended beyond origin of vertebræ. “*Right Subclavian pervious* at, and beyond the point to which I had supposed the ligature was applied, and the coats of the vessel exhibited no evidence of having been ligated.” Trachea was very much compressed by tumour, which was cause of death. Left innominate vein obliterated. Left vertebræ not enlarged.

Drs. Hutchison and Krackowizer were of opinion that the ligature had been placed around the *sheath* of the subclavian and not around that artery. Certainly the artery had not been tied. The *pulsation* in the axillary *before* the operation may have been accounted for by the flow of blood through a partially occluded subclavian, and its arrest *after* the operation, to sudden occlusion of the subclavian by a coagulum, worked out of the aneurism by the increased volume of blood immediately following ligation of carotid. He says the relief of dyspnœa which followed the operation was due to division of the cervical fascia and muscles, which allowed the tumor to recede from the trachea. (*Med. Record*, 1867.)

CASE XLIV. *Aneurism of Innominate (involving small portion of Arch); Ligature of Right Carotid; Death in a few hours from Cerebral Anæmia (the left carotid having been previously almost entirely obliterated).* Key.—Elizabeth G., æt. 61, Sept. 1828, observed a pulsating tumour above sternum a little to right. Progressively enlarged until Oct. 15, 1828, when it was size of egg. Extends up one-third length of mastoideus, and out one-third length of clavicle. Pain, numbness in neck and right arm. Good family history. Valsalva method tried for five months. She improved, and left hospital March, 1830. Growing worse again, right carotid was tied July 20, 1830. At moment of tightening ligature, tumour became decidedly smaller. This was not permanent, since before she left the theatre it was nearly as large as before the operation, though its beat was fainter. Half hour after being put to bed, severe cough and terrible dyspnœa came on and lasted a few minutes. She then fell into a sleep, and died so quietly that the attendants did not know when she was dying.

Autopsy.—Pint and a half of serous fluid in both pleuræ; four ounces in pericardium. Arch of aorta very much dilated, its inner surface studded with ossific patches. Sac from right wall of innominate and adjacent arch size of small orange. Right carotid and subclavian sound. Sac was more than half filled with laminæ of fibrin in various degrees of consolidation. The left carotid at its mouth was almost completely plugged by fibrin, scarcely admitting a small probe. Vertebrae smaller than usual. (*London Med. Gaz.*, Aug. 1830, p. 702.)

CASE XLV. *Aneurism of Innominate (involving a small portion of Transverse Aorta); Ligature of Right Carotid; Death on nineteenth day from Suffo-*

cation due to Pressure of Aneurism and Incipient Pneumonitis. G. W. Campbell.—John S., æt. 48, while splitting wood, the axe being raised full above his head, felt something give way in lower part of his neck, accompanied by temporary dyspnœa. A pulsating tumour, size of a marble, appeared immediately at the right sterno-clavicular joint; was inebriated; had had rheumatism in right shoulder. Tumour grew steadily, and soon became size of hen's egg. Pressure on right carotid arrested pulsation in sac, and similar effect, but in a less degree, pressure on the right subclavian. Strict rest, digitalis, restricted diet faithfully tried for two weeks, and as tumour continued to increase, right carotid was tied March 8, 1845. Immediately upon tightening the ligature the aneurism completely disappeared. After a short while it reappeared, but never became as large as before. Pulsations less forcible. On tightening the ligature complained of pain in the head, pupil of left eye became dilated, and he felt "confused." 11th. Tumour diminished to size of walnut. 22d. Tumour quite flat, and slight pulsation. Compress reapplied (as had been done several times). 23d. Worse after exposure to cold. High fever and cough, with dyspnœa. Pulse 140. Bled. 24th. Aneurism apparently extending. 27th. Dyspnœa, heart action tumultuous. Died from suffocation, due to pressure of tumour and incipient pneumonitis.

Autopsy.—Sac size of heart; commenced at root of innominate, involving whole of the anterior portions of this vessel to within one-quarter inch of its bifurcation, and small part of transverse aorta. Two smaller sacs extended from and communicated with the large aneurism. Large sac nearly filled with laminated coagulum. Aorta dilated and ossific. Right carotid plugged. Upper part of right lung consolidated from pressure. Left lung congested and pneumonic. (*Lond. and Edin. Med. Journ.*, 1845.)

(c) CASE XLVI. *Aneurism of Innominate; Ligation of Right Carotid Artery; Improvement; Recovery.* Pirogoff.—Male, adult, aneurism behind sterno-clavicular articulation, spreading beneath upper border of sternum. Sleeps in sitting posture. Unable to walk on account of dyspnœa. Heart sounds normal. Moist râles; cough, expectoration, foamy, mucous. Tied right common carotid. First few days after operation marked improvement in breathing, can assume almost horizontal posture. Coughs and expectorates less. Area and pulsation of tumour decreased. Condition continued to improve in course of four weeks. 6th week. Able to go about. Tumour pulsates, but not strongly. After two and a half months, so much improved that he was discharged. Tumour still pulsating, but much diminished. Chest symptoms disappeared. [Further history of case is unknown.] (*Allgemeinen Kriegschirurgie*, 1864, p. 457, 8.)

CASE XLVII. *Aneurism of Innominate; Ligation of Right Carotid; Death on seventh day from "Cerebral Complications."* Dohlhoff.—After the ligature the condition of the aneurism improved very notably.

Autopsy.—Tumour was large as fist, developed from the outer wall of the innominate, near its bifurcation. The calibre of this artery was normal, except that part implicated in the aneurism. Right carotid and right subclavian were not involved. Sac contained a large quantity of coagulum, seemingly composed of solid fibrinous material, forming a layer an inch thick. In the centre was a cavity containing fresh (probably post-mortem) clots. (*Broca, Anévrysmes*, p. 641.)

CASE XLVIII. *Aneurism of Innominate; Ligation of the Right Carotid; Death on the seventh day from Rupture of the Sac into the Trachea.* Hutton.—Man, æt. 47; good health to March, 1841, when he was attacked with pain in right shoulder and clavicular region. Dry cough in June; soon after dysphagia. Now he noticed a small pulsating tumour under right sterno-mastoid. No bruit. Right radial pulse less than left. Cough and dyspnœa. Dysphagia has become less as the tumour has risen above the sternum. Right carotid tied June 27. For several days tumour gradually diminished, and dyspnœa less, until, on twenty-second day, hemorrhage occurred from the wound, which recurred. Thirty-eighth day, epileptoid convulsions; also on forty-first day. Next day tumour had increased in size, pulsated more strongly, and bloody sputa. A sudden enlargement of the tumour occurred on the sixty-fifth day, accompanied by syncope. Died seventy-sixth day.

Autopsy.—Aneurism (of innominate) contained purulent matter and grumous

blood, which communicated with trachea. Coagulum in right carotid; same, of longer standing, in the subclavian. (*Dublin Med. Journ.*, 1852, p. 85.)

CASE XLIX. *Aneurism of Innominate; Ligation of Right Carotid; Death from "Cerebral Complications," Paralysis, etc. on fifth day.* Neumeister.—Male, æt. 51, good constitution. Large aneurism of innominate, pulsating with great violence. June 13, 1829 or '30, tied right carotid. Next day, pulsations not quite so strong, and pain in right arm and shoulder less. 16th. Partial loss of vision in right eye; pain in right ear; mind began to wander; paralysis of left side, which increased on next day, and death on the 18th.

Autopsy.—Aneurism of innominate large as a fist, which had eroded the right clavicle. Carotid closed by clot. (*Dublin Med. Journ.*, vol. i., 1852, p. 94.)

CASE L. *Aneurism of Innominate, as diagnosed; Ligation of Right Carotid; Slight temporary improvement; Death some time afterwards from Rupture of Sac.* John Scott.—Enormous pulsating tumour near right sterno-clavicular articulation. Ligation of right carotid. "The upper part of the tumour, some time after the operation, appeared to have somewhat diminished." Scott proposed later to tie the right subclavian, but patient would not consent. Shortly afterwards the sac burst, causing instant death. No autopsy allowed. (*Lancet*, 1834-5, vol. i. p. 893.)

CASE LI. *Aneurism of Innominate; Ligation of Right Common Carotid; Death.* Ordile, of Naples.—Communicated to Mr. Holmes. Operation made about 1859. Result fatal. (*Holmes's System of Surgery*, vol. iii. p. 577.)

CASE LII. *Aneurism of Innominate; Ligation of Right Common Carotid; Marked improvement; Death, seven months later, from Asphyxia, due to Pressure of the Consolidated Aneurism upon the Trachea.* V. Mott.—M. G., farmer, æt. 51, good history. Three years ago, while lifting heavy timbers, felt sharp pain in neck. Eighteen months since he noticed a small tumour at upper end of sternum. On examination there is a pulsating tumour, size of pigeon's-egg, under right mastoideus, near the clavicle. Pressure of sac on bronchi causes dyspnoea. Grew worse; suffocation was imminent; and on September 26, 1829, right carotid tied. 27th. Breathes better. Oct. 16. Tumour above sternum, and pulsation entirely disappeared; voice natural; cough and breathing better. 26th. Left town. April, 1830. Dyspnoea returned. Patient had starved himself to emaciation, on his own responsibility trying the "low diet" remedy to cure the aneurism. He died in April, 1830, from asphyxia, due to pressure of the consolidated aneurism on trachea.

Autopsy.—Tumour had dislocated right clavicle, which was partially eroded. It extended from inner end of left clavicle across to middle of right clavicle, and downwards to third rib. Trachea greatly displaced. Sac size two fists, and originated from innominate, involving slightly right carotid and right subclavian. Walls of sac firmly consolidated; carotid obliterated; subclavian pervious. (*Mott's Velpeau*, vol. ii. pp. 344.)

CASE LIII. *Aneurism of Innominate; Ligation of the Right Carotid; Death from Hemorrhage from the Carotid on twentieth day.* V. Mott.—Male, æt. 60. Operation about year 1820. Arterial hemorrhage occurred when the ligature came away, and about twenty days after operation. Patient died about twentieth day from hemorrhage. ("First Prize" Essay, *Transactions American Medical Association*, 1878.)

CASE LIV. *Aneurism of Innominate; Ligation of the Right Carotid; no Improvement; Death from Progress of Aneurism.* Nussbaum.—No report of this case other than a note written to Prof. Gurlt from Nussbaum, which states that the aneurism was of the innominate; that the operation was unsuccessful, and that the aneurism continued to grow, and caused death. (Dr. C. Pilsz,¹ *Archiv für Klinische Chirurgie*. B. 9, Berlin, 1868, p. 386-7.)

(d) CASE LV. *Aneurism of Innominate and Root of Right Carotid; Ligation of Right Carotid; Recovery; Cure after Abscess in and Rupture of Sac.* Evans.—Wm. H., æt. 30, good health; accustomed to prolonged exercise on

¹ Another similar operation by Nussbaum is given, but the result is not definitely stated, and I do not include it here on that account. I infer from the German text that it was also fatal.

horseback. Fourteen months ago began to be troubled with dyspnœa and cough on any extra exertion. March 10, 1828, after a fit of coughing, a soft pulsating tumour, size of a walnut, was seen behind and slightly above right sterno-clavicular articulation; pressure on subclavian artery increased, while pressure on right carotid diminished, and at times completely arrested pulsation in aneurism; cough and dyspnœa ceased when tumour appeared above the clavicle; put on Valsalva's treatment April 3, 1828; bled eight ounces every third day; gruel, broth, and tea for diet—rest in bed; digitalis; during first month slight improvement. May 1. Symptoms aggravated; tumour increased rapidly, and was painful on pressure. July 20. Tumour had reached level of cricoid cartilage. Operation July 22, 1828. 23d and 24th. Tumour pulsates stronger than before operation. 25th. Bled $\frac{3}{4}$ vi. 27th. No diminution in size of sac. 29th. Suddenly worse, seems to be dying; profuse ptyalism; rallied, and continued to improve; on this day it was noticed that the *pulsation ceased in the vessels of the right arm*; ptyalism persisted from July 29 to Sept. 10; partial paralysis of entire right side of body. Thirteen weeks after the operation numbness and debility of right side have nearly disappeared; he is more irritable, and memory is feebler. "It is now five weeks since he resumed his business duties, and he attends regularly the markets, which are seven miles distant." Several months later a large abscess developed on the tumour, which, gradually increasing, burst Aug. 24, 1830, and gave exit to twenty-four ounces of pus; this healed up by November. May 16, 1831. No trace of tumour, and in perfect health. Nine years after operation Wardrop writes, he did not suffer from feeble-mindedness as he did soon after operation. (Wardrop, *On Aneurism*, p. 93; *Lancet*, vol. i., 1828: Broca, *anéurysmes*, p. 622.)

CASE LVI. *Aneurism of Innominate, involving portion of Right Carotid and Right Subclavian Arteries; Ligature of Right Carotid; Death in forty hours.* Porta.—Female, æt. 60, operation in 1842. No cause of death given. Details fail. (Langenbeck's *Archiv für Klin Chir.*, 1868, p. 382.)

CASE LVII. *Aneurism of Root of Right Carotid and Innominate; Ligature of Right Carotid; Recovery with marked Improvement; Death twenty months later after Prolonged Exertion.* Morrisson.—Hurrut, male, æt. 42, good history, pain in cardiac region, dyspnœa, hemiparesis of right side, large pulsating tumour behind right sterno-clavicular articulation; pressure on right carotid did not diminish perceptibly pulsation in sac, while pressure of right subclavian did. Nov. 8, 1832. Right carotid was tied, soon afterwards pulsation in tumour "*tremendous*," and much distressed by "hollow sounds in head;" bled 16 oz. 9th. Venesection $\frac{3}{4}$ x. 11th. Tumour pulsates strongly. 14th. Venesection $\frac{3}{4}$ viii. 16th. Digitalis prescribed, but soon discontinued. 17th. Tumour tender to touch, and from this date it began to harden and diminish; convalescent, and went to hard labour, making charcoal; he was doing well. July 4, 1834, one year and eight months after the operation, and after a long walk, he "dropped down dead."

Autopsy.—Innominate double ordinary size, and studded with ossific patches. Right carotid from origin to ligature was dilated into a sac, which was plugged up with a dense fibrous deposit. The portion of the tumour within the chest was much more voluminous than that which rose into the neck; lungs healthy; endocarditis marked; induration of semilunar valves of aorta with "ossific matter;" arch of aorta completely ossified and dilated; eight to ten ounces of serum in pericardium. Cause of death not stated. (*Am. Journ. Med. Sci.*, vol. xix. p. 329.)

CASE LVIII. *Double Aneurism of (1) Right Carotid and Root of Right Subclavian, and (2) of the Innominate; Ligation of the Right Carotid; Death on twenty-first day.* Vilardebo.—Negro man, æt. 70, enormous aneurism extending from the sternal end of clavicle to lower jaw; had been treated by Valsalva's method with no success; ligation of right carotid; death on twenty-first day. Cause of death not given.

Autopsy.—Right carotid obliterated; sac in neck involved this artery; all of its inner surface was lined with laminated, tough, fibrin except a globular cavity filled with black blood; a second portion of the sac extended downwards and outwards, resting on the apex of the right lung; another and separate aneurism, much smaller than the preceding, sprang from the posterior wall of the innomi-

nate, filled with firm organized clot, excepting a central blood channel; aorta dilated. (*Archives Générales*, Series 4, 1847, t. xv. p. 547.)

CASE LIX. *Aneurism of Innominate involving very slightly the root of Right Subclavian; Ligation of the Right Carotid; Death as a result of the operation on the seventh day.* Fergusson.—Chas. M., æt. 56, labourer, admitted June 12, 1841. Good health until last three months, when he was seized with severe pains in right side of head, neck, arm, and shoulder. One month later he noticed a pulsating tumour at sterno-clavicular joint. Drank spirits occasionally. Had old cough. Now tumour is size of an orange. Pressure on right carotid caused diminution in tumour; pressure on right subclavian caused less change; simultaneous pressure on both vessels caused a rapid decrease in tumour. Right radial pulse less perceptible. Valsalva method tried for ten days, but swelling increased. Operation June 22, 1841. Tumour slightly diminished in size a few minutes after tightening ligature. 23d Cough less troublesome; pain on swallowing. 24th. Tumour decidedly smaller, and pulsates less. 25th, 26th. Better. 27th. Troubled with cough. 28th. Bronchitis evident, venesection to $\frac{3}{4}$ xxvij. 29th. Cough better, but dyspnœa increased. Fergusson says "it can scarcely be doubted that death was occasioned by the operation."

Autopsy.—Middle lobe of right lung engorged with blood and mucus. Aneurism developed from anterior wall of innominate about three-quarter inch from aorta. Root of right subclavian slightly involved. No clot in carotid. Sac nearly filled with firm clots of fibrin. (*London and Edin. Monthly Journ. Med. Sci.*, 1841, vol. i. p. 786.)

CASE LX. *Aneurism of the Third Portion of the Right Subclavian, and Immense Dilatation of the First Portion and the Innominate; Ligation of the Right Carotid; Death eighty-eight hours after the Operation.* Butcher.—J. H., æt. 42; admitted May 1, 1863. Large pulsating tumour of right side of neck; imputed to extra exertion while white-washing ceiling in Nov. 1862. Was healthy and temperate. Pain in right neck and shoulder. Tumour first noticed in February. Situated between anterior edge of trapezius and outer edge of mastoideus and down to clavicle, about size of half a large apple. May 6, 1863. Butcher exposed right subclavian, first division, but finding it diseased exposed innominate. This, too, being diseased, he tied the right carotid three-quarter inch above its origin. 7th. Perfectly free from pains he had suffered from before operation. No pulsation in tumour. 8th. Passed an excellent night. At 12 P. M. sudden and prostrating symptoms supervened; dyspnœa, and death at 2 A. M.

Autopsy.—Right subclavian, first part, dilated, larger than normal aorta; innominate twice its normal size. Aneurism of third portion of subclavian. Layers of recent fibrin deposited in sac, and a large recent clot filled central portion. Axillary artery filled with clot; none in carotid. Arch and innominate atheromatous. (*Butcher's Operative Surgery*, 1865, p. 855.)

(c) CASE LXI. *Aneurism of Right Carotid; Ligation of same; Immediate Improvement; Death on sixty-first day from Hemorrhage from distal side of the Ligature.* James Lambert.—F., æt. 49. Pulsating swelling right side neck, size of large walnut. Astley Cooper consulted, who said "it was aneurism by dilatation, which would not increase." Operation March 1, 1827. Fisherman's silk. Immediate diminution in size, and pulsations less forcible. Third day union, tumour scarcely perceptible, and felt hard. Slept better than for two years. 11th. Hemorrhage $\frac{3}{4}$ ij. April 17, granulations in cicatrix. 18th. Hemorrhage from wound, and at intervals till 23d. May 1, died from profuse hemorrhage.

Autopsy.—Heart and lungs sound. Hemorrhage from ulceration of carotid beyond ligature. Aneurism filled with clot, carotid obliterated. (*Wardrop, On Aneurism*, p. 36; *Lancet*, vol. 12, p. 219.)

CASE LXII. *Aneurism of Right Carotid; Ligation of Right Carotid; Recovery; very marked and continued improvement.* George Bush.—Mary C., æt. 36, in March, 1826, observed pulsating tumour size of small hen's egg in upper part of lower third of neck in track of carotid, which progressively enlarged until Sept. 2, 1827. Tumour now extends from clavicle to near os hyoides, pushing trachea to left; emaciated, dysphagia, and dyspnœa for months. For nine days prior to operation had not been able to swallow food. Operation Sept. 11, 1827. Immediately on tightening the ligature tumour became softer and smaller. She

could swallow liquids in a few minutes after operation. Until 14th day she was bled four times. Twenty-seventh day tumour reduced one-half. April 19, 1828, in perfect health, respiration and deglutition normal; there is scarcely a remnant of the tumour. (Wardrop, *On Aneurism*, p. 49.)

CASE LXIII. *Aneurism of Right Carotid; Ligation of same; Recovery; Ulceration and Rupture of Sac; Very great Improvement, and Reported as Cured.* Wardrop.—Female, æt. 75; duration of tumour three months, size of fist; after operation, tumour strapped with adhesive plaster “to keep up a certain degree of pressure;” immediate diminution in size of tumour. Fourth day, had decreased one-third; fifth and sixth day, increased; eighth, smaller and sac ulcerated, discharging several blood clots; twentieth day, cure complete. (Wardrop, *On Aneurism*, p. 27; *Med. Chir. Trans.*, vol. xiii. p. 217.)

CASE LXIV. *Aneurism of Right Carotid; Ligation of Same; Recovery from the Operation; Death from the Progress of the Aneurism and General Anasarca three months later.* Wardrop.—Male, æt. 57; good health until four years previous, when he had severe pains in head and apoplexy; two years later, similar attack; six months ago tumour, two inches in breadth, appeared beneath right mastoidæus. Operation, Dec. 10, 1826; after operation, five grains calomel; second day, fainted twice; ligature used was silkworm gut, recommended by Fielding. Three months after operation took cold, cough, fever, and tumour increased in size; died, March 23d.

Autopsy.—General anasarca, heart hypertrophied three times normal size, calcareous patches in aorta and innominate, right vertebral occluded, tumour size of almond, coats thin and contents readily emptied by pressure. (Death not due to aneurism.) (*Lancet*, Dec. 23, 1826; *On Aneurism*, p. 31.)

CASE LXV. *Aneurism of Left Carotid; Ligation of Same; Death on sixty-seventh day from Broncho-Pneumonia and Rupture of Sac into the Lung.* Lane.—J. F., æt. 36, duration six months. After operation, pulsation increased in sac; third day, ice applied to tumour. Aug. 5th and 6th. Tumour decidedly harder, and less prominent. 22d. Slight hemorrhage from wound, venesection to ʒxij. Broncho-pneumonia supervened, and patient died September 13th.

Autopsy.—Sac adhering to left lung with which it communicated by circular ulcerated aperture, filled with firm layers of coagulum except at its commencement from aorta and part contiguous to left lung, artery above tumour obliterated. (*Cooper's Surgical Dictionary*, 8th ed., vol. i. p. 215.)

CASE LXVI. *Aneurism of the Left Carotid; Ligation of the Same; Recovery; Marked Improvement.* Colson.—Female, æt. 63, tumour at left sterno-clavicular articulation, large enough to interfere seriously with respiration; first noticed swelling three years before, and attributed it to a violent choking a man had given her. Tied left carotid beyond tumour; tumour immediately began to decrease, and the dyspnoea was less marked. One year after operation, tumour size of a small nut, and pulsates slightly. The eye of this (left) side is entirely out. (*Gazette Médicale*, Sept. 12, 1840, p. 589.)

CASE LXVII. *Aneurism of Right Carotid, low down; Ligation of Right Carotid; Recovery; Very Marked Improvement; Probably Cured.* Jas. R. Wood.—Betsey B., coloured, æt. 36, acquired syphilis. Dec. 1840, aneurism, size of walnut, just above sternum. 13th. Right carotid was tied; tumour immediately diminished very much in size; complained of a queer feeling in the head, which passed off soon. 14th. Doing well. 15th. Slightly erysipelatous blush in wound. 17th. Doing well; aneurism much smaller, and of considerable firmness. Jan. 10th. Saw patient; she stated she was perfectly well. Saw her occasionally for next six months. Tumour gradually decreased, and as far as I know she had no further trouble. (*New York Med. Journal*, 1857, p. 20.)¹

¹ In *Gazette des Hôpitaux*, 1879, p. 1029, Delens reports a case of ligation of the left common carotid, which I infer to be a distal operation for aneurism of this vessel low down, but the language is ambiguous, and the details fail as is too often the case in these reports. The aneurism was at first reduced in size, and the bruit ceased, but in two months it had regained its original size.

SERIES III. *Distal Ligation of the Subclavian Artery alone, on account of Aneurism.*

CASE LXVIII. *Aneurism of Innominate; Ligation of the Right Subclavian (third division); Recovery; Marked Improvement; Death two years later, due in part to the presence of the Aneurism and partly to general systemic failure.* Wardrop.—Mrs. D., æt. 41, pulsating tumour size of turkey's egg situated partially behind manubrium, and rising into neck to tracheal side of right mastoids; no pulse in right carotid; severe pain in left head and neck; dyspnœa; does not sleep well; pale and yellow. Disease commenced eleven months ago. Five months later she noticed tumour at upper edge of sternum; was treated then by venesection, digitalis, low diet, and perfect quiet, all to no purpose; grew steadily worse. July 6, 1827. Right subclavian (third division) was tied; relief to breathing immediate. 15th. Pulsation in right carotid, due (possibly) to diminution in size of aneurism, and relief from pressure. Twenty-two days after operation tumour greatly reduced in size; she continued to improve. In August, 1828, had severe attack of bronchitis. Four months later a second tumour appeared above sternum, and soon after another, which seemed to correspond to origin of right carotid, which, growing slowly, interfered with deglutition and respiration. In July, 1829, anasæra supervened, and she died Sept. 13.

Autopsy.—Tumour, size of turkey's egg, adherent to sternum, was composed of three lobes; was firm and nearly entirely solidified. There was a small central cavity, or blood channel, which led from the aorta to the right carotid, which was pervious. Patches of calcareous deposit on aorta. (Wardrop, *On Aneurism*, p. 66; Broca, *Anévrysmes*, p. 619; *Lancet*, 1828–29, vol. ii. p. 788.)

CASE LXIX. *Aneurism of Innominate; Ligation of the Right Subclavian (third division), the Right Carotid, erroneously supposed to have been obliterated; Recovery, with Marked Improvement; Death from Gangrene of Left Lung five months after operation.* Paul Broca.—Male, æt. 50, who had had a pulsating tumour above right clavicle for about a year. Right sterno-clavicular joint destroyed; had convulsive movements of left side of body during twelve days; difficult articulation for some time; pulse absent in right carotid; dyspnœa and dysphagia. Aug. 25, 1862. Broca tied right subclavian third division. 26th. Dyspnœa and dysphagia relieved, and pulsation in aneurism less violent. Ligature came away on twentieth day. After recovery tumour still continued to pulsate, and was about same size; it was much more solid, and pulsations less forcible. He went on perfectly well till February, 1863, when gangrene of left lung occurred, and he died of this last disease.

Autopsy.—Aorta dilated quarter more than normal. Aneurism occupied whole length of innominate, communicating with aorta by an orifice 4 c.m. (about 1 inch) in diameter. Tumour inclosed an enormous mass of clot, in the centre of which was a cavity of the size of a small egg, which communicated with the carotid by an oblique and flattened opening, and on the outer side with the subclavian. Carotid was pervious. (*Holmes's System of Surgery*, vol. iii. p. 575; *Lancet*, Feb. 2, 1870, p. 11.)

CASE LXX. *Aneurism of the Innominate, treated by Ligation of the Subclavian Artery, third division.* Thos. Bryant.—Male, æt. 33. Operation Aug. 1871. Carbolic catgut. A good recovery ensued, and considerable consolidation of the aneurism. Patient was still alive September, 1872. (*Bryant's Surgery*, Phila., 1873, pp. 189.)

¹ Mr. Heath considers this case a "cure as far as the aneurism is concerned." Broca as a partial cure. In *Amer. Journ. Med. Sci.*, July, 1880, there is also an error in connection with this case, since the writer states "the carotid being and remaining occluded by pressure." It was found *pervious* after death, and it is more than likely that if it had been completely occluded by pressure during the long continuance of this disease it would have been completely obliterated.

SERIES IV.—*Distal Ligation of the Axillary Artery alone on account of Aneurism.*

CASE LXXI. *Aneurism of the Right Subclavian; Ligation of the Axillary; Death from Syncope on eighth day.* Dupuytren.—N., æt. 40, male, admitted May 28. Five months previous he suddenly felt a pain at right side of root of neck, and two days later noticed a swelling at this point. Rest, venesection, and constant application of ice tried without effect. Tumour increased. June 12. Size of hen's egg. On this day axillary was tied, cutting through pectoralis major and deltoid. 15th. Tumour diminished and pulsation less strong. Compress and ice bladder applied. 17th. Not so well, violent cough and slight hemorrhage from wound; venesection. 18th. Venesection. 20th. Died in syncope.

Autopsy.—Eight ounces sero-sanguineous fluid in both pleuræ. First and second ribs worn through. Numerous points of hepatization in right lung. Aorta enormously dilated and "having at numerous spots fungous growths, erosions, etc." Right subclavian diseased throughout. Tumour formed by it extended beneath the clavicle. Contained very little laminated fibrin and few clots. No clot in artery at ligation. A small opening in artery, "attributed to pulling on the ligature during the dissection." (*Lond. Med. Gazette*, vol. iv. p. 321.)

CASE LXXII. *Aneurism of the Right Subclavian Artery; Ligation of the Axillary; Death from hemorrhage on twelfth day.* Petrequin.—Male, æt. 59. Aneurism first portion of subclavian; size of small apple. Had existed three months; no cause given for its origin. Sept. 27. Right axillary tied at lower border of first rib. 29th. Punctured tumour and injected nine drops perchloride of iron and manganese. Compression was previously made on innominate. 30th. Pulsation in sac nearly ceased. Oct. 3. Bronchitis, pneumonia, severe cough. 7th. Profuse hemorrhage from wound of ligature. Compress of lint in perchloride of iron. 8th. Two hemorrhages. 9th. Death from loss of blood.

Autopsy.—Axillary gaping at point of deligation. Sac filled with clots and pus, and its walls inflamed. (*Comptes Rendus de l'Acad. des Sci.*, 1853, 37, p. 940.)

CASE LXXIII. *Aneurism of Right Subclavian throughout its length; Ligation of Axillary; Immediate Relief and Improvement; Later Death.* Canton.—J. J., negro, æt. 32; three months previous to admission, after unusual exertion with the arm, he felt a pain at sternal end of right clavicle, followed by an aneurism at this point. Tumour grew rapidly and was prominent above and below clavicle. Pressure on the axillary arrested pulsation in sac; very weak and suffering greatly. Dec. 12, 1863. Right axillary was tied. Tumour ceased immediately to pulsate. Artery tied at edge of coraco-brachialis as high up as possible. 30th. Pulsation less; tumour firmer. Patient died. Holmes does not state cause of death. (*Med. Times and Gaz.*, Jan. 2, 1864; *Holmes's Surgery*, 2d ed., vol. iii. p. 578.)

CASE LXXIV. *Aneurism of Innominate; Ligation of the Right Axillary (or Subclavian very near the lower border of the first Rib); Right Carotid previously obliterated by Disease; Death from Asphyxia on thirty-first day.* Langier.—M. C., male, æt. 57. Tumour size of large hen's egg, pulsating, behind right sterno-clavicular articulation. Dyspnœa and dysphagia; ligation of right axillary, first portion. Artery was approached from beneath clavicle. [This bone was dislocated and crowded upward and inward by the growth of the aneurism.] Operation June 12, 1834. Tumour decreased immediately, pulsated less forcibly, patient breathed easier and slept well, which he had not done for some time before. 19th to 22d. Slight arterial hemorrhages from wound. July 2. Cough distressing, pain in back, tumour pulsating more violently than before operation. 9th. Terrible dyspnœa and cough, which increased, and he died on the 12th, one month after operation. Cause of death, asphyxia.

Autopsy.—Sac involved innominate. Aorta dilated. Sac nearly filled by firm dense layer of coagulated fibrin. Lower part of tumour contained more recently

¹ Holmes, in *System of Surgery*, 2d ed., vol. iii. p. 578, gives this case erroneously as one of ligation of the third part of the subclavian. The mistake arises from his quoting from the article in *Gaz. Hebdom.* The original article from which I get the above extract states positively that the axillary was tied.

formed coagulum and one clot extended from this into the aorta. Right carotid was completely obliterated. (*Lancet*, March 21, 1835, p. 889.)

In reviewing the cases given in this article, I shall deal with the most important facts as demonstrated by clinical experience. It is not within the scope of this paper (nor would it become the writer), to enter into a general consideration of aneurisms. Broca, in his great work on "Anévrysmes," and Mr. Holmes, in his magnificent series of Lectures on Aneurisms (*Lancet*, 1872), have left little to be said by others upon this subject. I shall not champion or condemn one of the most difficult and dangerous operations known to surgery, for the relief of one of the most formidable diseases to which our anatomy is heir, and which when left to itself rapidly leads, almost without exception, through suffering and suspense to inevitable death. The facts as given speak for themselves.

Summary of Series I.—I have collected thirty cases in which the *right carotid* and *right* subclavian arteries have both been tied on the distal side of an aneurism. The first twenty-four of these I have considered as simultaneous operations upon the right carotid and third portion of the right subclavian. Cases XXV. to XXIX. inclusive, were operations with an interval varying from forty-nine days to two years. Case XXX. was a simultaneous ligation of the right carotid and of the *first portion* of the right subclavian.

In the first seven cases the disease was in the ascending or transverse arch, or in both, and in four of these the operation was made with the belief that the aneurism was located in the innominate. In only three cases then (Mr. Barwell's, Mr. Lediard's, and my own) has this operation been made for a recognized aortic aneurism.

Of these seven cases, two died as a result of the operation; Case III. on the fifth day from occlusion of the aorta by clot projecting from the aneurism; Case VI. on the thirty-fourth day from rupture of the sac. The remaining five cases recovered with marked relief of the distressing symptoms which necessitated the operation. Case I., ten weeks after the operation, is progressing very favourably as far as the condition of the aneurism (for which the operation was made) is concerned. Case II. was temporarily relieved and lived thirteen months, dying from the progress of the aneurism. In Case IV. the relief was very notable, the patient dying four years later from rupture of the sac. In Case V. relief was immediate. The original aneurism decreased and became firmly consolidated, the patient dying fifteen months later from "general wearing out," due to dissipation and the presence of the tumour added to a naturally weak constitution. Case VII. was much relieved by the operation, and eight months afterward is still under observation.

Effects of the Operation on the Sac.—In Case I. there was no instantaneous change in the tumour immediately after tightening the ligatures. Within twenty-two hours the diminution of the tumour as judged by the

shrinkage of the protruding portion was very evident, and by the fourth day it had shrunk from an elevation of one inch and a half above, down almost to the level of the sternum. Ten weeks after the operation it is still smaller than before, is solidifying steadily (as far as can be judged by the sense of resistance to pressure) and the area of dulness is more limited. In Case II. "the tumour diminished after the operation and visible pulsation ceased." In Case III. it is very probable that there was no decrease in the size of the sac. In Case IV. "tumour gradually diminished in size." In Case V. "pressure on bronchus was to a great extent relieved." In Case VI. "tumour somewhat smaller the day following occlusion of the carotid. Decreased one-half two days after ligature of the subclavian." Two weeks later it began to increase again. In Case VII. there was next morning less impulse over aneurism. Twenty-sixth day expressed himself much relieved by the operation.

In ten cases (VIII. to XVII. inclusive) the aneurism involved the innominate alone. Four recovered: Cases VIII., XII., XVI., and XVII. Case VIII. was remarkably successful (as near a cure as could be expected), dying three years and four months later from pleuritis. Cases XII. and XVI. very greatly improved and still under observation. Case XVII. recovered, and would in all probability have continued to improve, but he went on a drunken spree for three days, after which the sac ulcerated and ruptured on the one hundred and eleventh day.

Six cases were fatal; in five of which death was positively precipitated by the operation and one (Case XV.) fatal from the operation together with reckless exposure to inclement weather. Case IX. on sixth day from "shock" (probably cerebral anæmia). Case XIV. on sixth day, certainly from cerebral anæmia. Case X. fatal hemorrhage from proximal side of subclavian ligature on the fifteenth day. In Cases XI., XIII., XV., the sacs burst on the twenty-sixth, fifteenth, and sixty-fifth days respectively.

Effects of the Operation on the Tumour.—In Case VIII. from May 4th to July 4th "tumour had undergone but little change, and although reduced in size the pulsation was still distinct. Eighteen months after operation no tumour visible." Case IX. "during the short time (six days) he survived, the tumour became smaller and more solid." Case XI. one day after operation pulsation slightly diminished. Fifth day tumour hardening. Case XII. first three weeks no change in tumour; then it gradually diminished. Four months after operation "somewhat reduced in size, can still be readily felt behind clavicle." Case XIII. five days after operation "better, breathing greatly improved." Case XV. day after operation "pulsation less marked and less pain;" forty days later "tumour rising in neck." Case XVI. ten months later "tumour decreased in size." Case XVII. "from the first the pain was greatly relieved and

gradually disappeared; tumour began to feel firmer, impulse feebler and more circumscribed."

In seven instances (XVIII. to XXIV. inclusive) the aneurism involved both the aorta and innominate. Of these, five died in from thirty hours to fifty-five days and I think death was precipitated in each case by the operation. They are respectively: Cases XX., on fifty-fifth day "œdema, exhaustion and ulceration of sac;" XXI., fiftieth day "external bursting of sac;" XXII., twelfth day "exhaustion;" XXIII., seventh day "asphyxia;" XXIV., thirty hours "asphyxia." Cases XVIII. and XIX. recovered with great improvement, the former dying nineteen months later from pleuritis; the latter in three months and ten days, from bronchitis and pneumonia.

Effects on Tumour.—Case XVIII., twenty-fourth day "pulsation diminished;" three months, "diminished in size, and signs of progressive solidification;" eight months, "no protuberance at former seat of aneurism." Case XIX. "pulsations in tumour decreased steadily with its dimensions;" two and a half months, "no tumour visible." Case XX. "at first diminished slightly in pulsations, but soon beat as strong as before operation;" thirty-fifth day, "sac growing rapidly and rupture imminent, etc." Case XXI. "in three days perceptibly less prominent and pulsation less violent." Case XXII. "relief to cough was immediate and complete for first three days, then it returned;" fifth day, "tumour seemed to diminish, and gave the sensation of greater thickness to its walls." Case XXIII. second day. "Pulsations more limited in area and diminished in force." Case XXIV. died too soon to observe any change. This concludes the 24 cases in which the *right common carotid* and the third portion of the *right subclavian* arteries were tied at (practically) a single operation for aneurism between the ligature and the heart.

Mortality.—In 7 cases of aortic aneurism, 2 died as a result of the operation. In 10 cases of innominate aneurism, 5 died as a result of the operation, and in one other death was hastened by exposure. In 7 cases of aorto-innominate aneurism, 5 died as a result of, or death was hastened by, the operation. Of the 24 cases, there is then a mortality of 13, following close upon the operation.

Recoveries.—Of the 11 recoveries, Case I. has progressed very well for the ten weeks since the operation. The tumour is not so projecting, is hard, though still pulsating. Case II. died thirteen months later from the progress of the aneurism. Case IV. died four years later from rupture of the sac. Case V. died in fifteen months from extension of the disease along the thoracic aorta. Case VII. improved and under observation eight months later to date. Case VIII. died from pleuritis (probably not connected with the aneurism) three years and four months after the operation. (The tumour in the thorax was about three inches in diameter.) Case XII. was progressing favourably four months after the ligature.

Case XVII. died one hundred and eleven days later. Case XVIII. died nineteen months later from bronchitis. Case XIX. died three months and ten days later from bronchitis and pneumonia.

In five instances (Cases XXV. to XXIX. inclusive) the right carotid was first tied and later the third portion of the subclavian. Cases XXV. and XXVI. recovered from both operations with very great relief. Case XXVII. immediate and temporary relief after each operation; death forty-four days after ligature of the subclavian from rupture of the sac. Case XXVIII. slight temporary benefit after the first, none after the second operation; death twenty-one days after last ligature from rupture of sac. Case XXIX. immediate and temporary relief from the first operation; only slight benefit from the second, which was followed by death from the progress of the disease, three months later.

Summary of Series II.—In thirty-seven instances the right or left primitive carotid has alone been tied on the distal side of the aneurism. Of this number nineteen were fatal (or 51 per cent.) as a result of the operation alone, or of this added to the gravity of the disease. The right carotid was tied in twenty-seven cases; of which seventeen died, or 63 per cent. The left carotid was tied in ten instances; two died (or 20 per cent.). The cases are detailed concisely and are arranged so as to be readily consulted, and I shall not, therefore, consume the space necessary for a complete *résumé*.

The following brief summary will serve as a reference to the cases given:—

(a) For aneurism involving the *aorta* alone eight cases are given (XXXI. to XXXVIII. inclusive). The *left carotid* was tied in all except two, viz., XXXVI. and XXXVII. One of these two (XXXVI.) died. All of the cases in which the ligature was applied to the *left carotid* “*recovered*” with “*improvement*,” as did the remaining instance in which the right carotid was tied.

(b) For aneurism involving the *innominate* and the *aorta*, the *right carotid* was tied in five cases (all fatal), and the *left carotid* in two instances, one fatal and one recovery with improvement.

(c) For aneurism involving the *innominate* alone the right carotid was tied in nine instances, of which six died and three recovered improved (one of these dying “*later*” from the progress of the disease, another seven months after the operation from pressure of the aneurism).

(d) For aneurism involving the *innominate* and one or both of its branches the (*right*) carotid was tied in six instances, of which four died as direct or indirect result of the operation.

(e) For aneurism involving the *carotid* alone, the *right* was tied in five instances, with one death; the *left carotid* in two instances, with one fatal issue.

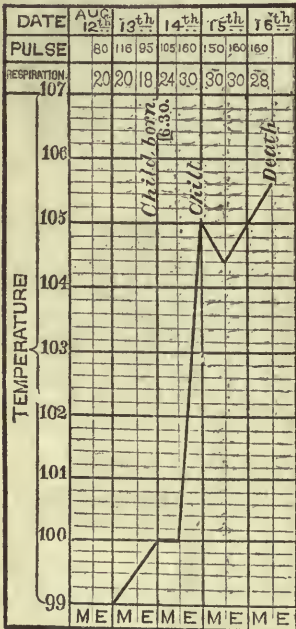
ARTICLE XV.

FATAL BURNS DURING ADVANCED PREGNANCY. THE BURNS OF THE MOTHER APPARENTLY IMPRESSING THEMSELVES ON THE CHILD IN UTERO. By WILLIAM HUNT, M.D., Surgeon to the Pennsylvania Hospital, Philadelphia.

I GIVE the facts of this case, and the illustrative drawings, without comment.

Anne L., aged 30, was admitted into the Pennsylvania Hospital Wednesday, May 8, 1880, for very extensive burns caused by her clothes catching fire from a kitchen grate. She was eight and a half months pregnant. She was finely developed, and had no evidence whatever about her of having had specific disease. Her husband was healthy, and so was a child of theirs, of about six years old, who came to the hospital while her mother was there. I saw the patient a short time after admission. As the case was evidently to be a fatal one, I immediately ausculted for foetal heart sounds, with the intention, if the child was alive, of leaving directions, if I should not be present myself at the time, for abdominal section to be performed at once upon the death of the mother, in the hope of saving the child.

Fig. 1.



I saw the patient a short time after admission. As the case was evidently to be a fatal one, I immediately ausculted for foetal heart sounds, with the intention, if the child was alive, of leaving directions, if I should not be present myself at the time, for abdominal section to be performed at once upon the death of the mother, in the hope of saving the child.

The foetal heart sounds were very distinct, and I asked my assistant, Dr. Wetherill, to time me with his watch, while I counted. The effort was a failure; it was impossible to count, so rapid was the action. At the same time the mother's pulse was 116. She had warmed up somewhat, as will be seen by the chart (Fig. 1), for on admission her pulse was 88, and she was in a condition of shock. The burns were treated in the ordinary method, and the patient was made as comfortable as possible. At the same time the child's condition was carefully ascertained by repeated auscultations. The excessively rapid action of the heart continued, and it was clearly heard at any time up to 12 o'clock P. M. on Thursday. At 2 o'clock

it was found that the heart had ceased to beat, so that within these last two hours death must have taken place.

At 5.20 P. M. on the same day, labour came on actively, terminating at 6.30 P. M. in the birth of a well-formed, but dead female child. The mother lived until Saturday afternoon, May 15, when she died.

The annexed pulse and temperature chart, taken at the time, will give the best idea of the progress of her case.

So much for the history. Now the important fact to record is, that *the child was apparently blistered and burnt in extent and in places almost exactly corresponding to the injuries of the mother!* The drawings (Figs. 2, 3, and 4), will have to answer for those who did not see the subjects of them. They are made from sketches taken at the time by Drs. Packard and Wetherill, entirely independent of each other.

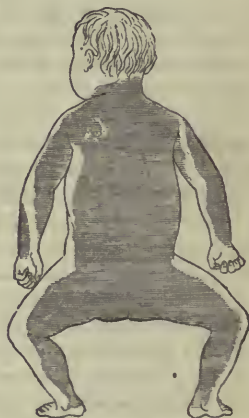
Fig. 2.



Fig. 3.



Fig. 4.



The blisters on the child were standing out fresh and full, as though recently formed, and in places the derm was deeply involved, as on the mother. The back of the mother was not sketched, for want of time, as her friends were in a great hurry to remove the body. It is sufficient to say that it was the seat of one continuous burn, as is shown upon the child. Of course, all ordinary explanations were suggested—pemphigus,

syphilis, maceration, etc. etc., but upon examination I think all, or nearly all, agreed that none of them fitted the case.

Besides the officers of the hospital there were many witnesses, amongst them I mention Prof. Penrose, Drs. E. A. Spooner, Albert Fricke, R. P. Harris, W. S. Forbes, W. B. Atkinson, J. C. Wilson, and the well-known dermatologists, Drs. Duhring and Van Harlingen.

ARTICLE XVI.

A CASE OF REMOVAL OF BOTH OVARIES FOR THE RELIEF OF AN EXHAUSTING MENORRHAGIA AND UTERINE FIBROID. By ANITA E. TYNG, M.D., of Providence, Rhode Island.

DR. GOODELL has said, "No operations on the human body offer so much of interest to the profession as those involving the cavity of the peritoneum. The vulnerability of this membrane, the important organs which it contains, and the fatal character of the diseases for the relief of which its sanctity is invaded, make the record of every case imperative." I take this for my reason for giving the following case in detail.

A single American lady, a school-teacher, consulted me in the winter of 1870, on account of the profusion of menstruation. The periods occurred at a regular interval, and lasted over a week, with occasional slight dysmenorrhœa. An examination was not allowed. I prescribed various remedies, as tannin, gallic acid, sulphuric acid, sulphate of iron alone and combined with nitric acid, and with nitro-muriatic acid, cannabis indica, and many others. Also hot vaginal injections, and Chapman's theory of heat to the back, which I have found very useful in other cases. Iron in any form except the sulphate always increased the flow. None of these remedies had any effect. After two years' trial of them, in 1872 I persuaded my patient to allow a digital vaginal examination. I found the vaginal portion of the uterus healthy and normal in every respect; the body felt heavy and enlarged, but not displaced. Ergot was then given in various forms, which increased the dysmenorrhœa, the pains having an expulsive character. I suspected an intra-uterine polypus. In August, 1876, I gave ether for the purpose of dilating the cervix and exploring the cavity. I used Ellinger's dilators, slowly dilating until I could introduce my finger a short distance into the cavity; as far as I could reach it felt hard and firm and *fibrous*. The same sensation was given by the sound, which would pass but a trifle beyond the normal length. While my finger held the uterus firmly, I felt externally for the fundus; the abdominal walls were well relaxed, and I found the whole body larger than normal and, also, I distinctly felt a sub-peritoneal fibroid on the right, just above the Fallopian tube, about the size of an English walnut. The dilatation had no effect upon the menorrhagia, and the future seemed to be only chronic invalidism, at least until the climacteric. My patient was now about forty years of age, and in the history of the family I found that the

change did not occur early, and was accompanied with similar profuseness; a grandmother had been confined to bed for two years on this account.

I continued the use of ergot, and ergotin hypodermically over the right side of the abdomen, and such tonics as seemed at times necessary to keep up the general health. The hypodermic injections seemed to check the discharge for a few periods only, but they created much irritation; the abdomen still shows many scars from the abscesses. In the meanwhile I was revolving in my mind methods for hastening the climacteric. I had three times assisted Dr. H. R. Storer in the removal of the uterus for fibroid disease, but the circumstances of my patient were such as to make this always formidable operation appear still more so.

The patient had for a long time complained of pain in the back; this became more severe after unusual fatigue, and was described as a "feeling of opening and shutting." It was sometimes relieved by a discharge of blood from the rectum, occasionally in large quantities. The spasmodic pain was relieved by suppositories of opium and belladonna, or of iodoform. The general strength continued to fail, the menorrhagia increased profusely, the patient grew thin and anæmic, suffering severely from headache, especially in the back of the head, a sensation described as "the back of the head and neck dropped out and was gone."

Last spring I learned that she had hemorrhoids both external and internal, and advised their removal. Thinking she must keep up until the end of the school year, the usual astringent ointments and opium suppositories were used and hypodermic injections of carbolic acid into the tumours, but without relief. On the 18th of June I etherized her, and took this opportunity for my third examination of the uterus. I found the whole body of it a fibrous mass, about the size of the third month of pregnancy, and anteverted; the extra tumour which I had discovered three years before was about three times its former size. Then proceeding to the rectum, I first dilated the sphincters, then removed by the *écraseur* a large internal hemorrhoid which hung down touching the sphincter, by its pressure there producing constant effort to evacuate, and thus the cause of so much suffering. I also removed four external tumours. The patient was kept in bed nearly a fortnight, and treated daily with douches of hot water carbolized. As soon as she could bear the journey she went to the country, where she remained until September, recuperating somewhat from the great weakness and nervous prostration, and gained a little in flesh and colour. The rectum became healthy, its action regular, and the evacuations easy as they had not been for years, but the menorrhagia not lessened.

This examination of the uterus led me to think of extirpation of the ovaries, that by thus ending ovulation the monthly stimulus, excitement, and engorgement would be ended, the blood supply cut off, the tumour starved for nourishment, and the usual atrophy of the uterus after the menopause should take place. Dr. Goodell says: "About fibroid tumours of the womb there can be no doubt. The relation here between cause and effect is unmistakable. Their growth and morbid effects are notably increased at each monthly flux, and notably lessened after the climacteric. In but few other pelvic disorders can we so positively single out the ovaries as the hurtful organ."

During these ten years I had had several occasions to observe the hemorrhagic tendencies of the family, all of them bleeding profusely from a slight scratch. This made me decide against the vaginal operation.

Jan. 8, 1880, five days after menstruation had ceased, was the day fixed

upon. The patient took a warm bath each night for three or four nights previous, and a grain of quinia three times daily for as many days. The bowels had been moved regularly, but an extra movement was induced the night of the 7th by an enema with ox-gall. On the morning of the 8th she had an injection of beef-tea with brandy, taking no food into the stomach. She was hopeful, cheerful, calm, and perfectly self-controlled. A Codman & Shurtleff atomizer kept up a carbolic spray. My assistants were Drs. Belcher, Weaver, Tomlinson, and Crawford. They had all carefully bathed with carbolized water, and wore fresh clean calico dresses.¹ A special duty was assigned to each one, and in each case was well and faithfully performed. The ligatures were of silk carbolized; the sponges were all new, had been boiled and carbolized; the instruments were new, and laid in carbolized water for an hour before being used. It was a bright day, and the sun shone directly across the abdomen.

There was no enlargement of the abdomen or any external sign of the tumour except the brown line from the umbilicus to the pelvis as seen in pregnancy. The incision was made in the median line, half way between the umbilicus and pubes, carrying it down to the pubes. I then inserted my hand for exploration; the uterus was found exactly as has been described as ascertained last June, with the addition of another small sub-peritoneal fibroid the size of a cherry on its anterior surface. The tumour at the fundus was constricted at its base, somewhat pedunculated and inclined backward, thus causing the anteversion. The right ovary was easily found, and was perfectly healthy; the left one was not in its normal position, and was not then found. The incision was then carried to the umbilicus; no bleeding was allowed; whenever the slightest occurred I waited until it was checked, thus the operation proceeded very slowly. The left ovary was now found higher in the abdomen than I had searched for it, and anterior to it a soft, round tumour, which had prevented my finding it, and which gave a distinct sense of fluctuation, apparently attached to the uterus, but was found to be situated in a fold of the broad ligament. On each side the ligaments were congested, the bloodvessels numerous and enlarged; the Fallopian tubes were very red and the size of an ordinary lead-pencil. Midway of its length on the right one were two yellow bodies the size of peas, supposed to be deposits of fat. The left ovary was now separated from the ligament by three double stitches crossed, ligated, and cut off. This ovary contained two small cysts, one of which burst, although care was taken not to make pressure upon it. The ovary was then cut away with the scissors, and the base seared with the Paquelin thermo-cautery at a dull red heat. The soft tumour in the broad ligament was then pierced with a trocar, which showed that it did not contain fluid; it was then decided to enucleate it; its base was ligated and cauterized, the edges of its peritoneal covering were brought together with two stitches of fine silk. It was about two inches in diameter, and on further examination was found to consist wholly of fat. The right ovary was then cut away and treated in the same manner as the left. There was no bleeding at any time during the operation, the ligated parts were not dropped into their places until I was satisfied that there would be no oozing, the drainage tube therefore seemed not needed. The intestines during the operation had been covered with soft linen cloths wet with hot carbolized water,

¹ I mention this as relating to the arguments of the day, *pro* and *con*, of antiseptic surgery.

and over these a rubber cloth which kept them perfectly warm. The abdominal wound was closed with nine sutures of silver wire, including the peritoneum, and eight superficial ones. The wound was covered with a strip of linen which had been soaked in hot carbolized water, then two thick layers of salicylized cotton, then a thin sheet of rubber, and next a many-tailed bandage of flannel. The bladder was emptied, and a suppository of opium, gr. j, placed in the rectum. An hour before the operation the pulse was 84, an hour after it was 104, temperature 98°. The pulse rose to 108, and the temperature to 102° at midnight. These were the highest figures; by the third day both pulse and temperature were normal. Opium suppositories were used at night for several nights, flatus was relieved by the insertion of a tube in the rectum. Food was given every two hours except when there was nausea.

While under ether for a few moments, the patient had a cyanotic appearance about the mouth, and the hands were quite blue. Pain in the right elbow, and following the course of the ulnar nerve to the ends of the fourth and fifth fingers, with numbness and tingling, were felt constantly for four weeks. The patient was first raised in bed two weeks after; she fainted, and had a tendency to faint, whenever fatigued or agitated, for several days. These symptoms made me fear embolism, but they all gradually subsided.

On the afternoon of the second day there was some discharge of blood from the vagina. I thought this a natural relief of the congested condition described, and let it go on until noon of the third day, when, finding it increasing, I gave ergot with Monsel's solution every hour until it decreased. The morning of the fourth day, January 12th, the flowing increased; the patient complained of headache, faintness, and chilly creeping sensations; she was very feeble, and the lips were pale. Ergot was again given, heat put under the back, and ice packed over the iliac regions. The wound was healthy, and partly healed by first intention. On the 13th the flow ceased entirely. On the 21st, when the monthly period was due again, there was a slight show and headache for a few hours, both of which occurred every day for a week. When the second period was due, Feb. 18th, there was headache, with flush of heat, cold feet, abdomen swollen, tympanitic, tender to the touch, and pain on the left side; pulse and temperature normal, however; bowels regular; urination painful. These symptoms subsided in a few days without any sign of flowing.

The bowels were kept quiet the first week, and then moved every second day by enema. Some of the stitches were removed on the eighth day, the remainder on the tenth. At the end of three weeks the patient was sitting up. A daily record was kept for two weeks.

In May the patient was annoyed by a sensation like prolapse. The uterus was nearly normal in size, lying across the pelvis, the cervix pressing upon the bladder, the tumour very much smaller, was wedged under the promontory, and could not then be lifted. In June the uterus was quite movable, no tumour discoverable by the vagina, rectum, or abdominal palpation. I then placed a closed lever pessary, as long as the vagina could retain, and which also anteverted the uterus somewhat; afterwards I changed it for a shorter one, which held the uterus, now of normal size, in its natural position. Entire relief followed; the patient grew stout and rosy, and now enjoys better health than ever.

I was asked at the time of the operation, by one of the physicians present, why I did not attempt the enucleation of the fibroid in this case. It

appeared as if it might easily be severed from its connection with the uterus. I replied at the time that I had read the reports of several cases where this had been done, and every one had been fatal. In this case the constricting neck was short, the bloodvessels visible on its surface very numerous, in one place a radiation like the sticks of a fan; there would thus be another wound in the peritoneum, another risk of hemorrhage.

Schröder speaks of the removal of subperitoneal pedunculated fibroids as an easy matter,¹ but Dr. Thomas is not in favour of it,² and Dr. Goodell says the subperitoneal variety attains the greatest size and is the least amenable to surgical interference.

Dr. W. L. Atlee and others have considered the subperitoneal tumours as non-hemorrhagic. If this is a rule, my case was an exception, unless, as the whole uterus was enlarged and fibrous in texture, this be taken as the cause of the menorrhagia, together with the general congestion of tubes and ligaments with the numerous and enlarged bloodvessels and the hemorrhagic diathesis.

I have given my reasons for choosing the abdominal section; the result showed I should have had difficulty in finding the left ovary had I operated by the vagina, owing to its high position and that of the fatty tumour.

Since I reported this case last March, I had the pleasure of hearing the discussion between Drs. Sims, Battay, and others, at the last meeting of the American Medical Association in New York on the points of value of the abdominal or vaginal method; the former received the stronger advocacy.

ARTICLE XVII.

AUTOPSY IN A CASE OF ANEURISM OF THE INNOMINATE AND SUBCLAVIAN ARTERIES, TREATED BY DOUBLE DISTAL LIGATION THREE YEARS BEFORE DEATH. By LEWIS A. STIMSON, M.D., Surgeon to the Bellevue and Presbyterian Hospitals, New York, etc.

In an article on simultaneous ligation of the carotid and subclavian arteries in the treatment of supposed aneurism of the innominate, published in this Journal for July, 1880, reference was made to a case in which Dr. Jas. L. Little, of New York, performed the same operation in a case of supposed aneurism of the first part of the subclavian, as follows:—

“The patient was a man forty-six years of age, who fell while carrying a heavy load upon his right shoulder. The next morning he noticed a marked change in his voice, and soon afterwards a pulsating tumour appeared just above the right

¹ Amer. Journ. Obstet., Jan. 1879, p. 198.

² Ibid., April, 1879, Trans. Obstet. Soc. N. Y.

side of the sternum. Severe pain in the shoulder and neck caused him to seek admission to St. Luke's Hospital nine months after the fall. A pulsating tumour giving no murmur was found above the inner end of the right clavicle, measuring $1\frac{1}{2}$ inches in lateral diameter, and extending 1 inch up the neck. Voice husky; right vocal cord paralyzed. The diagnosis of aneurism of the first portion of the subclavian was made, and Dr. J. L. Little tied the carotid and the subclavian in its third portion May 4, 1877. The tumour presented but little, if any, change during the following three months, and then diminished perceptibly during the fourth month, after an attack of left hemiplegia and aphasia, which occurred July 23d. The patient recovered partially from the paralysis. The left arm remaining somewhat rigid, and a year after the operation the tumour had almost entirely disappeared. He is still living, and there has been no recurrence of the disease."

This patient died of phthisis September 2, 1880, and the specimen is preserved in the Wood Museum of Bellevue Hospital. As the aneurism proved to involve the innominate as well as the subclavian I desire, with the approval of Dr. Little, to place a description of it on record as an addition to the article above referred to. The examination was made after the specimen had been preserved in alcohol for six weeks.

Aorta.—Arch uniformly dilated, measuring 5 inches in circumference, and somewhat atheromatous. Thoracic portion not dilated.

Heart.—Rather small; valves normal.

Aneurism. External appearance.—An irregular lobulated mass, broad above and pointed below, occupies the position of the innominate and subclavian arteries; its lower margin or apex nearly touches the arch of the aorta. It is $2\frac{1}{2}$ inches high, its upper surface broad and flattened, with one conical peak nearly an inch broad and high on its anterior inner angle, and another of similar size on the posterior outer angle, inclined backwards, upwards, and outwards. The mass spreads around behind the trachea to its left border, pushing the œsophagus over to the left. The carotid rises from the middle of the upper inner border; the subclavian comes from the outer portion of the upper surface, and is partly (below and behind) surrounded by the mass; its branches are seen near by, cut across, and patent. The internal jugular vein and phrenic nerve pass down the anterior surface, the vein being distant $1\frac{1}{2}$ inches from the origin of the carotid; the pneumogastric nerve lies close to and just behind the vein; it loses itself in the wall of the sac, and is thicker and denser than usual.

On laying open the aneurism by an incision extending from the subclavian across the upper surface to the anterior inner angle and thence directly down to the aorta, the innominate is found of normal size in the half inch of its course adjoining the aorta; the sac spreads backward and outward from the outer and posterior portions of the innominate, involving all of it except its first half inch, and the whole of the first and most of the second portions of the subclavian. It is lined throughout by a layer of firm white fibrin from $\frac{1}{8}$ to $\frac{1}{2}$ an inch in thickness, which is not adherent to the sac, except at a few points. It is closely adherent at the lower posterior portion, where it adjoins the normal portion of the innominate. The two cones at the upper part of the sac are completely filled by this clot, and the wall of the anterior one is very thin. The central cavity, which is as large as a large hen's egg, is loosely occupied by a soft red clot, and communicates with the aorta and third portion of the sub-

clavian. The orifice of the carotid is occluded, not by the clot, which is very thin at that point, but by adhesion of its sides due apparently to the pressure of the mass.

Vessels.—The subclavian artery is completely divided at the site of the ligature, which was applied about one-eighth of an inch on the distal side of the superior intercostal artery. It terminates abruptly, preserving its calibre to the end, and its wall at this point is but little thicker than elsewhere. All its branches, except the internal mammary which was not found, are pervious and not noticeably enlarged. There is no clot on the proximal side of the ligature. The distal portion is adherent at its end to the anterior surface of the first rib.

The carotid is narrowed and occluded, but not divided at the seat of the ligature, being represented at that point by a short fibrous cord smaller than the vessel. It is slightly dilated for an inch above its origin, and somewhat contracted in the half inch adjoining the ligature on each side. The seat of the ligature is about an inch below the angle of the bifurcation. Within the proximal portion is a red, firm clot, a little thicker than a match, extending from the origin of the artery to the ligature, and adherent at those two points, but not adherent elsewhere. This clot is apparently formed of blood that had been imprisoned in the vessel, either by the ligature, if the origin of the vessel was closed at the time of the operation, or by the closure of the orifice at some time subsequent to the operation. No collateral branch could be found on the proximal side of the ligature. An adherent clot occupies the distal portion, extends a short distance into and occludes the internal carotid. The external carotid is patent.

The internal jugular vein is occluded by adhesion of its walls where it crosses the front of the aneurism; and at its junction with the subclavian is an adhesion in the centre of the vessel, one-eighth of an inch in diameter, uniting the anterior and posterior walls. The subclavian vein is pervious.

Brain.—There is a spot of softening at the posterior third of the internal capsule on the right side.

Lungs.—Phthisical cavities were reported in both apices.

ARTICLE XVIII.

THE "PATHFINDER," A NEW INSTRUMENT FOR FACILITATING THE DIAGNOSIS AND TREATMENT OF STRICTURES OF SMALL CALIBRE. By STUART ELDRIDGE, M.D., Surgeon to the General Hospital of Yokohama, Japan; late Lecturer on Anatomy, Medical Department, University of Georgetown, Washington, D. C.

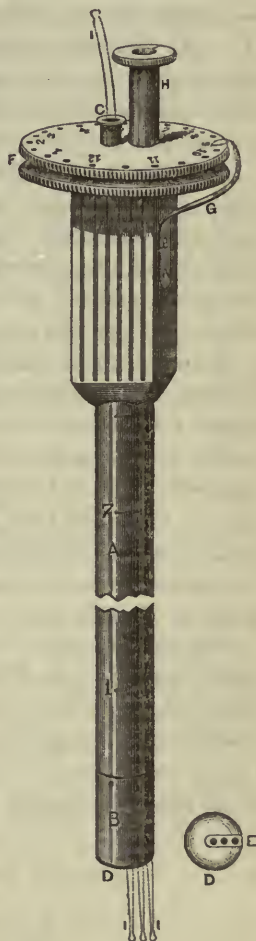
IN operating upon or examining tight, eccentric, or tortuous strictures, or those complicated by false passages, or sacculated urethra, the primary object of the surgeon is, or should be, the passage of a whalebone guide, for, when this is once in position, any other instrument required may be safely passed upon it. An experience in the management of urethral strictures, so considerable as to include nearly two hundred operations of internal urethrotomy, has taught me, however, that the insertion of a

guide is by no means invariably an easy matter; the very elasticity and flexibility, which constitute its chief merits, prevent us from intelligently varying the position of its point as regards the face of the stricture, so that seeking in this manner for the opening of the canal is but a blind process at best. At one sitting we may be fortunate enough to enter at the first trial, while at the next, hours may be spent in vain efforts to detect an opening.

Various expedients have been suggested from time to time, as assisting in the operation, such as filling the urethra with guides, or passing a large open tube to the stricture so as to distend the face of the contraction, and allow free movement to the guide. These, and other measures, are often of much use, but something more is needed. The desideratum is an instrument which will enable us to explore, systematically and in succession, each individual point of the face of the stricture, and, when an opening has been detected, to record its position, in reference to the urethral axis, so that it may be found again with little delay or trouble. The instrument shown in the figure enables us, at least approximately, to fulfil these indications.

The instrument (Fig. 1) consists essentially of three tubes, the outer (A) including an enlarged and squared portion, serving as a handle, being nine inches long, and of a calibre which will fairly distend the average healthy urethra, viz., twenty-five millimetres circ. This outer shell rotates freely upon a second concentric tube within, save for one centimetre of its length, at the point (B), which is fixed to the inner tube. A third tube, of diameter just sufficient to allow of the easy motion within it of an ordinary whalebone guide, is adjusted in the second tube in such manner that while its upper extremity is fixed and projects above the top of the instrument (C), its lower opening, which is nearly flush with the end of the lower tubes, is movable from the axis of the instrument outward to its circumference, or *vice versa*. The lower end of the outer tube is closed by a slightly convex diaphragm (D D), a slot in which (E), allows of the reciprocating motion of the small tube. A dial with milled edges (F), divided into twenty-four degrees, is fixed to the top of the inner large

Fig. 1.



tube, which it serves to rotate and by means of an index rising from the outer tube (G), serves to point out the position of the slot which moves with it. A thumbscrew (H) above the dial controls the reciprocating motion of the small tube, one turn of the thumbscrew moving the lower end of this tube one-half a millimetre outward or inward as may be desired. The small dotted circles in slot E of the figure show some of the innumerable possible positions of the part. The result of these arrangements is that the lower end of the small tube may be made to describe a series of concentric circles against the face of the stricture, varying in diameter by one millimetre or less, and that each point in the circumference of any and every circle may be successively tested for an opening by the whalebone guide (shown in three positions in the figure as the dotted outlines 1 1). An opening once found, the position of the dial, and the number of turns made by the thumbscrew may be noted, when at any future time it will be possible to place the guide tube in a corresponding position, and to again pass the whalebone with but little loss of time.

I have found the instrument in practice to perform all that I expected from it; false passages are avoided with ease and certainty, while contracted and ordinarily inaccessible channels are found quickly and repeatedly; the only departure from mathematical exactness in the action of the instrument, and the records of position taken from it being due to the necessary slight play allowed to the whalebone guide within its tube, and to the movable and elastic nature of animal tissues. It may occasionally be found necessary slightly to incise the meatus, in order to pass the instrument, but this fact can hardly be considered as an objection to its use, in view of the many advantages gained. An accomplished maker, however, will, I think, be able to construct the instrument in such a manner that the shaft shall be of smaller calibre than as shown, while the tip (B) can be changed for smaller or larger sizes as may be required, the rest of the instrument, and its mode of action, remaining as now. In the vast majority of cases, however, the present form will be found suitable.

I call the apparatus a "Pathfinder," but should it be deemed worthy of a higher-sounding title I would suggest the name Eisodozete (εἰσοδος, an entrance, ζητεω, I seek), as sufficiently pedantic. As I have necessarily been my own constructor as well as designer, I have sent working drawings of the instrument to Messrs. Tiemann, of New York, who will no doubt be able to furnish it on demand.

REVIEWS.

ART. XIX.—Recent Works on Diseases of the Throat.

1. *Conférences Cliniques sur les Maladies du Larynx et des premières Voies.* Par le Dr. ISAMBERT. 8vo. pp. xi. 418. Paris, 1877.
2. *Die Laryngotomie zur Entfernung intralaryngealen Neubildungen.* Von Prof. PAUL BRUNS. 8vo. pp. viii. 211. Berlin, 1878.
3. *Ueber Laryngoskopie und Rhinoskopie und ihre Anwendung in der ärztlichen Praxis.* Von JOHANN SCHNITZLER. 8vo. pp. 62. Wien: Urban & Schwarzenburg, 1878.
4. *The Throat and its Diseases, with one hundred typical illustrations in colour, etc.* By LENNOX BROWNE, F.R.C.S.Ed. 8vo. pp. x. 351. London: Ballière, Tindall & Cox, 1878.
5. *Lessons in Laryngoscopy and Rhinoscopy; including the Diagnosis and Treatment of Diseases of the Throat and Nose.* By PROSSER JAMES, M.D. Third ed. 12mo. pp. viii. 162. London: 1879.
6. *Sore Throat, its Nature, Varieties, and Treatment; including Affections of the Throat and other Diseases.* By PROSSER JAMES, M.D. Fourth ed. 12mo. pp. 336. London: J. & A. Churchill, 1879.
7. *Diseases of the Throat and Nasal Passages.* By J. SOLIS COHEN, M.D. Second edition. 8vo. pp. xviii. 742. New York: 1879.
8. *Handbook of Diagnosis and Treatment of Diseases of the Throat and Nasal Cavities.* By CARL SEILER, M.D. 12mo. pp. vi. 156. Philadelphia: Henry C. Lea, 1879.
9. *Die Rhinoscopie und Pharyngoskopie. Für Specialisten, Chirurgen und praktische Aerzte.* Von Prof. RUDOLPH VOLTOLINI. Second edition. 8vo. pp. vi. 292. Breslau: 1879.
10. *Die Kehlkopfsschwindsucht, nach Untersuchungen im pathologischen Institute der Universität Leipzig.* Von Dr. OSCAR HEINZE. 8vo. pp. 99. Leipzig: Veit & Co., 1879.
11. *Klinik der Krankheiten des Kehlkopfs, der Nase und des Rachens.* Von Prof. CARL STOERCK. 8vo. pp. xi. 555. Stuttgart: 1880.
12. *A Manual of Diseases of the Throat and Nose, including the Pharynx, Larynx, Trachea, Œsophagus, Nasal Cavities, and Neck.* By MORELL MACKENZIE, M.D. Lond. Vol. i. *Diseases of the Pharynx, Larynx, and Trachea.* 8vo. pp. xii. 570. Philadelphia: Presley Blakiston, 1880.
13. *A Practical Treatise on Nasal Catarrh.* By BEVERLEY ROBINSON, A.M., M.D. (Paris), Lect. on Clin. Med. at Bellevue Hosp. Med. Col. 8vo. pp. x. 182. New York: Wm. Wood & Co., 1880.
14. *Archives of Laryngology.* Edited by LOUIS ELSBERG, M.D. New York: G. P. Putnam's Sons, 1880.
15. *Pathologische Anatomie des Larynx und der Trachea.* Bearbeitet von Prof. HANS EPPINGER. 8vo. pp. vi. 302. Berlin: 1880.

THE rapid issue from the European and American press of works upon the pathology and treatment of diseases of the throat and adjoining struc-

tures, suggests the propriety of grouping the principal systematic contributions of the past three years or so for purposes of comparison and comment. In addition to the works noticed at the head of this review, a number of works and of elaborate monographs in the various languages have been issued in the same period, the mere enumeration of which would occupy several pages, while a simple index of the articles contributed to current medical literature within the same limit of time would probably take up more space than has been assigned to this entire review. Beside the new American magazine devoted to laryngology and its cognate branches, six annual volumes have been published of the bi-monthly *Annales des maladies de l'oreille, du larynx (Otoscopie, Laryngoscopie, Rhinoscopie) et des organes connexes*, under the editorship of Drs. de Lacharrière and Krishaber, of Paris; the *Monatsschrift für Ohrenheilkunde* has, since 1875, added to its title *sowie für Nasen, Rachen, Kehlkopf, und Luftröhrenkrankheiten*; and, during the present year, a monthly journal assigned to these subjects has been commenced in Bordeaux under the title *Revue Mensuelle de Laryngologie, d'Otologie, et de Rhinologie*, edited by Dr. E. J. Moure; while, finally, it is said that still another serial devoted to the specialty is about to be issued from Heidelberg. For three years the American Laryngological Association has held an active annual session. An International Congress of Laryngology was established in Milan in September last; and a subsection on laryngology has been assigned separate work at the International Medical Congress to be held at London during the coming August.

The great activity evinced in the prosecution of the study of diseases of the throat is, in great measure, encouraged by the facility with which inspection of the mucous membrane of the larynx, trachea, upper pharynx, and nares permits the leisure study of the pathological changes of these portions of the body in the living subject, and thus contributes in great measure to the knowledge of the pathology of morbid processes in the mucous tissues at large. The valuable monograph of Heinze on the pathology of throat consumption and that of Eppinger on the pathological anatomy of the larynx and trachea, as well as a number of similar studies which have done their authors much credit, are direct outcomes of the startling disclosure of Czermak, that the laryngoscopic mirror was capable of utilization in the diagnosis and treatment of a great class of diseases previously obscure. The physiological toy, so long regarded with distrust, has assumed an important position in the outfit of the practitioner; and familiarity with its use is an indispensable prerequisite for graduation in several European medical schools.

Of all the enthusiastic workers with the laryngoscope, Mackenzie, of London, has the most widespread reputation. His manual recently published, though not until some ten years after its announcement, and still incomplete as it is, has been rendered into German by his talented assistant and colleague Dr. Semon, and has been reprinted in the United States. While alluding to this translation it may be stated that Dr. Semon has not hesitated to indicate a number of points upon which his views differ from those of the author, and that, at the request of the latter, the German article on Diphtheria is a translation of Dr. Mackenzie's elaborate monograph on that subject, and not of its summary in the manual.

The clinical conferences of the late Dr. Isambert are admirable illustrations of clinical teaching. Isambert was an artist as well as a clinician, and his descriptions of form and colour combined a precision and accuracy

which greatly facilitate the comprehension of the laryngoscopic images of disease, especially when delicacy of appreciation is requisite in certain differentiations of diagnosis. Hence the lectures on laryngeal phthisis, syphilitic laryngitis, acute miliary tuberculosis of the throat, and carcinoma, present many interesting and original features.

Schnitzler's Manual consists of six lectures on laryngoscopy and rhinoscopy, comprising an historical summary, a description of the appliances necessary for inspecting the larynx and nares, with concise instructions for their employment; the whole illustrated by a series of excellent cuts. For those who read German, it is a reliable introduction to the study of the subject.

Dr. Browne's volume is rather meagre in the text, but is quite practical, and is illustrated by a series of artistic chromo-lithographs which attest equally the delicacy of the author's pencil, and the accuracy of his observations. It was fully reviewed in the issue of this Journal for Oct. 1878.

Dr. James's "Lessons in Laryngoscopy and Rhinoscopy," and his volume on "Sore Throat," are manuals that have well sustained the reputation of one of the original investigators in laryngoscopy, as evinced by the recent demand for new editions of both works in rapid succession.

The second edition of Dr. Cohen's "Diseases of the Throat and Nasal Passages" has been fully noticed in the issue of this Journal for October, 1879.

Dr. Seiler's Handbook was noticed in our issue for July, 1879. It is intended chiefly for students, and contains a number of valuable practical hints and suggestions, not the least important of which is the recommendation to cleanse all instruments employed on syphilitic subjects by plunging them in alcohol and then setting fire to the spirit.

Dr. Voltolini's Manual is a systematic, detailed, but rather tedious history and physical description of the various methods employed and sought to be employed in inspecting and otherwise exploring the nares and pharynx. It is entirely too controversial. Following the chapter on exploration is a dissertation on the physiological investigations to which rhinoscopic inspection has given impetus; chiefly as regards the closure of the pharynx, the movements of the palate, and the opening and closure of the pharyngeal extremity of the Eustachian tube.

Voltolini's personal researches lead him to deny any complete occlusion between the pharyngo-nasal and pharyngo-laryngeal cavities during speech; and to assert that there is simply a horizontal duplicature or bulge of the posterior surface of the soft palate. But twenty-three pages of the entire volume are devoted to the practical applications to be drawn from pharyngoscopy and rhinoscopy, and this is almost exclusively confined to observations on the use of the galvano-cautery, and the introduction of the Eustachian catheter. The volume of this veteran in rhinology is illustrated by a few excellent plates and a number of instructive wood-cuts. The chromo-lithographic representation of the rhinoscopic image differs from that presented by other observers, chiefly because the use of the uvula-elevator and the peculiar obliquity given to the reflecting surface of the mirror changes the angle of vision and alters the perspective. It is anatomically correct from the point at which the view is taken.

Prof. Stoerck's Clinical Manual is the outcome of more than twenty years' practice and clinical teaching. Its author is now the senior European authority upon the subjects of which he treats, and as he has gone through the laryngologomania in all its stages, his conclusions may be

accepted with considerable confidence. Many minor hints in general utilization have emanated from this operator, who still adheres to some of the simpler methods for illumination and inspection devised in the early days of recognized laryngoscopy, and this especially in appliances for class demonstration. His water-lens, made of a globular bottle, and his large concave reflector are no longer illustrated in other manuals, and are barely alluded to for their historic interest; but in the volume before us they appear as prominently as ever. Stoerck has exercised great care and discretion in the anatomical portion of his Manual, which, without being too lengthy, mentions all important structures, and figures them in a series of the most instructive illustrations that have come to the writer's notice. The physiological observations in this volume are of great assistance to the student, and include observations on voice and speech as well as upon the movements of individual structures. Many of the most available instruments successfully used in laryngoscopic and rhinoscopic surgery are the device of Prof. Stoerck. His manual may be regarded as indispensable for any throat specialist capable of reading German, but its utility is marred by the lack of an index for ready reference.

Mackenzie's Manual evinces more systematic labour in its preparation than any of the others on the list; and general acknowledgment is given in the preface for a certain amount of aid without which it would have been practically impossible for a busy practitioner to prepare a volume so copious and accurate in its references, so exhaustive in its historic compilations. When we take into consideration the facility of the access of British and continental authors to the large medical and scientific libraries of the great literary centres of Europe, the wonder is that similar avail is not more frequently resorted to. Mackenzie's volume will remain valuable to all time for its historic interest alone.

The published records of contemporaneous observers are frequently alluded to more or less directly, in illustration of views accepted or criticized by the author, and, incorporated with the collated statistics and vivid impressions of probably the most extensive personal experience in the profession on the subjects in hand, they are wrought into a lucid exposition of the present state of our knowledge of them.

The first volume, all as yet published, is a concise treatise on diseases of the pharynx, larynx, and trachea, with an appendix of special formulæ. Each section begins with the anatomy of the parts, followed by descriptions of the methods of examination; and then the diseases are discussed seriatim under Anglicized headings, followed by their synonyms and the equivalent expressions in Latin, French, German, and Italian. Then comes a definition of the disease, which is finally discussed in its etiology, symptomatology, diagnosis, pathology, prognosis, and treatment.

The illustrations, as a rule, are excellent, and the wood-cuts of instruments are for the most part drawn to a scale. We are surprised to see an error retained in the important representation of the laryngoscopic image, in which, both in the original and in its translation, the thyroid cartilage is indicated as the cricoid, and the cricoid as the upper ring of the trachea; the intervening crico-thyroid membrane, larger than either in the image, not being indicated by any reference at all. An excellent general index which closes the work in the original, has been divided into an index of authors and one of subjects in the German edition.

Dr. Robinson's treatise on "Nasal Catarrh" is a practical volume, mainly the outcome of individual experience; and as such, is more valuable than

an elaborate compilation. The illustrations, though varying in excellence, are sufficiently effective. A number of practical formulæ are given, and a good index completes the volume.

The *Archives of Laryngology* is a quarterly periodical devoted to Laryngology and those subjects usually associated with it, excluding the ear, which, as indicated by the European journals on the specialty, is properly regarded abroad as in consonance with the throat, rather than with the eye. In the management of this journal, Dr. Elsberg has the aid of Drs. Cohen, Knight, and Lefferts in this country, and of a number of distinguished collaborators abroad. The numbers which have appeared are creditable, and have thus far maintained the literary interest of the publication.

While much similar matter is to be found in these manuals and treatises, especially as regards historical data, and allusions to rare and important cases, there are individualities sufficient, in the majority of instances, to make them complement rather than supersede each other. Views of pathology differ, as is to be expected. So do methods of treatment, and methods of effecting the same ultimate objects. The desire to make a treatise complete has led to too much historic repetition, and we think the time has long ago come for this portion of laryngological literature to be relegated to reference-notes. The desire, too, to maintain claims of priority in having seen the first case of this or that disease, in having suggested this or that remedy, appliance, or method of manipulation, and the like, has led, especially in the German volumes, to much unnecessary personal recrimination, which is not of the slightest interest to the profession, or to their patients. As these contested points were duly heralded in current medical literature, allusion thereto should now be limited to simply indicating the whereabouts of these ephemeral productions for the instruction of those whose interest may prompt them to consult them.

To select a few diseases interesting the general practitioner and the throat specialist respectively, and ascertain the concurrent and divergent views held by these various teachers of their specialty at the present date, may prove instructive to both classes of readers.

To begin with chronic follicular pharyngitis as that affection of the throat most frequently encountered, in which the experience of every one of our authors should be ample, we find that there is lack of unanimity even as to the nature of the enlargements which constitute its most prominent feature. The affection is so common that it ought not to be difficult, in localities where post-mortem examinations are cultivated, to find a number of cadavers in which the pharynx afforded the requisite opportunity for histologic investigation. Stoerck, having excised a number of these enlargements from the living subject, declares that they are not follicles at all; but are simply circumscribed masses of swollen epithelial cells, deprived of their protecting exterior squamous layer; and Mackenzie shrewdly remarks that "the morbid changes are in fact more in the epithelium than in the follicles," thus intimating that both views can be entertained in combination.

In the treatment of this affection it seems to be generally acknowledged that topical destruction of the hypertrophied masses is requisite. Isambert, James, and others apply nitrate of silver in solution or substance; Mackenzie, the London paste; Voltolini, the galvano-cautery; Browne, the galvano-cautery, not to the elevations themselves, but to the enlarged capillaries surrounding them, so as to cut off their nutritive supplies; and

Stoerck removes them bodily with a special scissor-gouge. Here we have ever so many ways of reaching the same end; and so the masses are destroyed, the practitioner may take his choice according to his convenience, or the resources of his armamentarium.

The subject of syphilitic pharyngitis is an interesting one, especially that variety of the latent hereditary disease, which, making its manifestations towards the period of puberty, is so often designated as scrofulous pharyngitis. This form of the disease, ulcerative in its ravages, controllable in most instances by the internal administration of large doses of iodide of potassium, not infrequently scars the patient for life; fastens the remnants of the destroyed palate to the pharynx or to the tongue; occludes the nasal portion of the pharynx in greater or less measure, or completely; and renders deglutition difficult. Isambert describes this affection as a scrofulous angina, basing his differentiation from syphilis, the difficulty of which he acknowledges, upon the yellower colour of the edges of the ulcers, and upon its unamenability to mercurial preparations. It appears to us that the recognition of this affection as an hereditary manifestation of syphilis, and its efficient treatment with iodide of potassium, would save many sufferers from vicious cicatrizations, even though an error be committed in attributing its origin to the specific virus.

The ordinary manifestations of secondary syphilitic affections of the pharynx are believed by Mackenzie not to require, usually, any constitutional remedies. He states that he has seldom employed any specific treatment for adults during the last eighteen years, and that he has rarely met with any tertiary phenomena in the throat among those whom he had treated solely locally for the earlier manifestations. In this view Mackenzie seems to stand alone; for even his translator takes occasion to differ from him as to the want of necessity for constitutional treatment of secondary syphilis of the pharynx, and alludes to the fact that tertiary manifestations are by no means necessarily exhibited in the throat as a consequence of the previous existence there of the secondary disease.

Nasal catarrh forms the exclusive subject of Dr. Robinson's volume. We believe that too much is made of nasal catarrh. Our own practice, which should include a great number of cases of the kind, is singularly deficient in them; and many who apply to us for treatment of the disease, simply suffer from slight hyperæmia of the nasal mucous membrane, usually the result of undue exposure. The facilities of access to the nasal passages, and to the naso-pharyngeal region, have so increased of late that it would be impracticable to enumerate the various devices for exploration and manipulation. Voltolini, in his volume on rhinoscopy and pharyngoscopy, figures a combination of two mirrors in the naso-pharyngeal space by which he claims greatly to extend the field of exploration. He likewise holds fast to an instrument for drawing the palate forward, so as to secure room for manipulation, although the uvula-holder has been generally discarded as practically useless, as a rule.

A considerable portion of Stoerck's manual is devoted to affections of the nasal passages; five of the most unsatisfactory pages in the book being sufficient to discuss acute and purulent catarrh of the nasal passages, catarrh of the frontal and sphenoid sinuses, and chronic nasal catarrh.

The climatic prevalence of chronic naso-pharyngeal catarrh in the United States, and the unsatisfactory manner in which it is treated, has prompted a number of clinical writers to encourage the resort of patients to their dispensaries, so as to enable them the more thoroughly to study the affection; and their labours begin to bear fruit.

After the usual anatomical introduction, and description of instruments and manipulations, Dr. Robinson divides the practical portion of his volume into chapters on the prophylaxis and general remedial treatment of various forms of coryza; on hypertrophy of turbinated bones; and on follicular disease of the naso-pharyngeal space (post-nasal catarrh). The most trustworthy abortive treatment for incipient coryza has been, in Dr. Robinson's hands, the immediate use of one of the following recipes: One teaspoonful of aromatic spirit of ammonia in an ounce or an ounce and a half of water, every two hours; or a teaspoonful, in the same quantity of water, every hour for six hours, and afterward every hour and a half, of a mixture of one drachm each of carbonate of ammonium and the solution of sulphate of morphia of the United States Pharmacopœia, in three drachms of almond emulsion. Minute doses of antimonial wine, one to three drops, every hour or so until relief or nausea follows, will be found efficient in many instances to relax the tension of the bloodvessels on which the condition at first depends, and give great relief; and as soon as this is obtained, or even previously, a brisk saline purging mixture may be taken to drain the blood serum by means of the intestinal irritation.

In discussing chronic coryza Dr. Robinson states that he has seen perforation of the nasal septum produced in more than one instance as a result of the habit of scratching the surface with the finger nail to detach adherent crusts of mucus. He reprehends the use of the nasal douche as a cleanser in the treatment of chronic coryza, and prefers the coarse nasal spray producer of Lefferts; using what is known as Dobell's solution, or some modification of it. He relies most on the use of powders propelled upon the diseased parts, by a current of compressed air from the hand-ball bellows in a special condenser. Several formulæ are given, for which the reader is referred to the volume. Browne, on the other hand, unhesitatingly condemns the use of powders.

And now we approach a portion of our subject in which our experience does not coincide with that of Robinson and many others who have encountered such numbers of cases in which the affection has been kept up by hypertrophy of the soft tissues covering the turbinated bones. What seems to have been rather the rule with these observers, has been rather the exception with the writer. Knives, scissors, snares, forceps, gouges, rasps and incandescent cauteries, have been recommended as essential, or convenient in getting rid of this redundant or intumescent tissue, or in exciting absorption in its mass. Dr. Robinson extols the use of the spray of the tincture of anthoxanthum odoratum (ten to twenty drops to the ounce) as a beneficial local application in many of these cases of hypertrophy; but he confesses that he is often compelled to destroy the exuberant tissue. This he does by means of evulsion with a special form of forceps, the jaws of which are grooved and serrated; or else by means of cauterization with the galvanic, or the thermo-cautery. The use of the galvanic cautery for this and similar purposes has received great extension of late years, chiefly through the example of Voltolini who rarely uses any other appliance for surgical interference in the nasal, pharyngeal and laryngeal cavities. While the use of this agent is regarded by Mackenzie as often superfluous in the presence of efficient chemical cauteries, the editor of the German edition of his work takes occasion to express an opposite opinion. Certain it is, that too general a use of this powerful agent is apt to lead to its injudicious employment; and cases are not unknown to those familiar with its results, in which serious and sometimes

irreparable injury has been done to sound parts. It must be remembered, too, that the incandescent cautery destroys the tissues with which it is brought into contact, and thus often abolishes their natural functions. Care must be taken in using this agent to protect the sound parts from its action by suitable guards; and in operations within the nasal passage, the ingenious device of Dr. Shurly of Detroit, figured in Dr. Robinson's volume, may be relied on as one of the very best. The electrodes devised by this same gentleman, figured in the illustration alluded to, are quite convenient, and the handle he employs is light and easily manipulated.

Follicular disease of the naso-pharyngeal space (post-nasal catarrh) receives extensive consideration at the hands of Dr. Robinson, who regards it as "the same disease as follicular disease of the pharynx, only differing from the latter by its localization and certain special symptoms, which are the consequence of this seat." It is to this misapprehension that he attributes the general lack of success in its treatment; and he presents his own methods of management with considerable detail, by means of which he claims to fairly hope to alleviate all, and to cure many of our patients suffering from chronic nasal catarrh.

Laryngeal phthisis, so called, has been quite a vexed subject among laryngoscopists for many years. Despite its frequency, and the frequency of its study, the only unanimity is as to the prognosis, which is generally acknowledged to be as grave as grave can be in most instances, if not in all. It was thought that the laryngoscopic mirror would throw such an amount of light upon the subject as to dispel all doubts as to its origin and inter-dependent relations with general tuberculosis. But no. While one set of observers contend for the possibility of detecting the primary manifestations of phthisis and of tubercle, in the larynx during life, another set claim misinterpretation in the physical signs on exploration of the chest, and such minuteness for the initial tubercle, that even were it on the surface, a lens would be requisite for its mere physical detection. Doubts have been expressed whether the ulcerative laryngitis of phthisis is even tuberculous. The minute investigations of Oscar Heinze, however, as recorded in the monograph to which attention has been called, seem so thorough and so accurate that his results must be accepted. Of 1226 phthisical cadavers examined in the pathological institute of the University of Leipzig during the years 1867-1876, ulceration of the larynx was found in 376 instances, and ulceration of the trachea in 99. While Heinze admits that the laryngeal ulcerations in phthisis are sometimes non-tuberculous in origin, he proves conclusively that the great majority are tuberculous. At the same time he distinctly states that it is impossible, even on the recent specimen, to determine the tuberculous nature of an ulceration by the unaided eye, a microscopical inspection being absolutely necessary. This disposes at once of the practicability of deciding upon the nature of the ulceration in the laryngoscopic image, at several inches distance from the eye, despite the elaborately detailed differential descriptions formulated by a number of laryngoscopists. Heinze's investigations furthermore establish the fact that the tuberculous degeneration in all instances proceeds from beneath the mucous membrane to the surface, and not in the reverse direction. These views being accepted, it is quite probable that all supposed cases of cured laryngeal tuberculous ulceration have been instances of non-tuberculous ulceration.

Heinze's researches completely negative the opinion entertained by many clinical laryngologists, that tuberculous ulceration of the larynx presented

absolute evidence of coexisting cavernous destruction of the lung tissue; for he has frequently encountered it microscopically in cases where there was no evidence of pulmonary cavities. Furthermore, while admitting the possibility of primary manifestations of tuberculosis in the larynx, he distinctly intimates that he has come across no cases, in his numerous dissections, which were not associated with the pulmonary lesion.

Eppinger devotes some thirty pages to a discussion of tuberculosis of the larynx, detailing the descriptions given by various pathologists and clinicians, and confirming the existence of miliary tubercles beneath the ulcers.

Mackenzie, in an admirable chapter on this subject, fully indorses the views of Heinze, and corroborates them by some investigations of his own instituted after his attention had been more prominently directed to them by the perusal of Heinze's monograph.

Stoerck devotes no less than sixty-seven pages to the subject of tuberculosis of the larynx, describing the laryngoscopic appearances minutely as they occur in the various anatomical structures of the organ. He insists strongly upon the possibility, in certain cases, of detecting the existence of tuberculosis by laryngoscopic inspection long before it is possible to elicit any evidence of the disease by physical exploration of the chest.

Isambert regards the disease as a laryngitis associated with the tuberculous diathesis. He describes the appearances in the catarrhal, ulcerative, and suppurative stages. But neither he nor Stoerck seems to call especial attention to the peculiar pyriform swellings of the aryteno-epiglottic folds, which are so prominently alluded to in the treatises in English. It can hardly be possible that the characteristic manifestation, so frequent in Great Britain and the United States should be infrequent on the Continent; and the oversight, therefore, seems rather remarkable. In this connection the admirable coloured illustrations of Browne are simply invaluable.

The inability of treatment to check the laryngeal disease is deplored by all our authors. Stoerck consumes but seventeen lines of his sixty-seven large pages to a consideration of treatment; confessing that all topical treatment is useless save the local application of morphia to relieve pain and thus facilitate deglutition; and stating that the only other treatment indicated is a methodic milk-cure, as it is termed, with favourable climatic surroundings. Mackenzie recommends the same constitutional treatment as is commonly employed in tuberculous disease of the lungs, with the application of mineral astringents to allay the irritability of the mucous membrane; perchloride of iron (3j ad 3j) having proved the most serviceable at his hands. In some cases he finds soothing inhalations of benzoin or of hop act very beneficially. But when the cough becomes very troublesome he finds that no treatment gives so much relief as insufflations of morphia one-eighth of a grain diluted with starch applied twice a day, increasing the dose, as required, to one-fourth or one-half of a grain.

James, who presents the subject chiefly from a clinical standpoint, asserts that several recoveries have taken place under his care; and he, therefore, maintains, in opposition to the majority of observers, that laryngeal phthisis is not incurable. He trusts to sprays, gargles, and lozenges as for chronic laryngitis; insufflating morphia when the pain and dysphagia become distressing.

The question of the propriety of tracheotomy as a means of putting the larynx at rest in the latter stages of the disease, is generally answered in the negative; the indications for the operation being limited to the neces-

sity for protection against impending asphyxia from mechanical obstruction in the laryngeal passage.

Mackenzie seems to have experienced but little difficulty in inserting the œsophageal-tube, for purposes of conveying stimulus and nourishment in these unfortunate subjects of this disease who are utterly unable to swallow sufficient nourishment to avert death by starvation. The attempt has often been made by the writer, but his successes have been exceptional, and he has been forced to rely, as far as practicable, on the judicious administration of nutritive enemata.

It is a matter of serious regret that we are compelled to acknowledge ourselves impotent in arresting the local progress of this distressing form of disease, and be compelled to limit our efforts to measures for obtunding sensibility, and thus rendering the path to the grave less horrible.

The subject of acute miliary tuberculosis of the throat has attracted the close attention of Isambert, who describes it minutely as progressing rapidly to ulceration, with a fatal termination, within a few weeks, under farther progress as acute pulmonic tuberculosis. The pain on deglutition in this disease is said to be greater than that in any analogous condition of the larynx; and the application of morphia powder seems to present the sole method of affording temporary relief. Stoerck and Mackenzie likewise discuss the subject of acute tuberculosis of the pharynx, with due acknowledgment to the observations of the French author. Happily the disease is of rare occurrence, even in Continental Europe, where it has been most fully described; and our knowledge of its very existence seems to have been in great measure a direct result of laryngoscopic investigations of sore-throat.

The lesions of the larynx in typhoid fever receive a careful pathological study from Dr. Eppinger. As is well known, ulcerative destruction of both soft and hard tissues of the larynx attends some cases of typhoid fever. Happily this complication is comparatively infrequent in this country; though it seems to be much more common in Europe.

This ulcerative laryngitis is to be regarded in part as a direct result of the infection of the blood, and in part due to the pressure to which the larynx is subjected on account of the decubitus of the patient, the pressure being between the cricoid cartilage and the vertebral column. A similar physical cause sometimes gives occasion to perichondritis of the larynx in debilitated, aged subjects, who are compelled to lie upon the back. Two interesting instances of this nature are related by Prof. Gerhardt, of Würzburg, in the opening number of the *Archives of Laryngology*.

Eppinger's article on the laryngeal lesions of typhoid fever occupies seventeen pages, and is illustrated by five wood-cuts, showing necrosis of the epithelium of the epiglottis, mycotic-necrotic ulceration of the ventricular band, invasion of bacteria in the cartilage at the base of a similar deep ulcer of the vocal process, rods of bacteria from the base of an ulcer of the arytenoid cartilage, and balls of micrococci, and forms and débris of bacteria from the base of an ulcer of the epiglottis. It will be seen from this that the lesion is in great measure attributed to local infection. This chapter is, perhaps, the most elaborate research into the special lesion that has yet appeared.

The subject of neoplasms in the larynx is an attractive one to the specialist, because his skill in making intra-laryngeal applications enables him to remove morbid growths, or destroy them *in situ*, without direct access by surgical incisions. One is quite surprised at the great frequency of

these growths; thousands of them having been reported, and thousands of them, doubtless, having remained unreported. Probably as operators begin to think no more about removing a polyp from the larynx than about removing one from the nose, or the tympanic cavity, they cease to record their cases, or even number them. The laryngoscope has been of great service in revealing the presence of benign neoplasms as the frequent cause of obscure subjective laryngeal symptoms attributed to special disease; and of equal service, if not greater, in affording a means of rescue from impending death without the infliction of serious injury on the parts which, for the time, might threaten life, or for life impair the voice.

As to malignant growths, the specialist, as a rule, is in favour of letting them alone. The general surgeon is often tempted to remove the morbid mass; sometimes even when the excision involves removal of the larynx with portions of tongue, pharynx, and palate.

As to benign growths, the specialist as a rule, insists on their removal through the mouth. The surgeon is usually tempted to split the larynx exteriorly for the purpose.

The excellent monograph of Paul Bruns is based on examination of the records of more than one thousand cases of operations through the mouth, and ninety-seven through the external incision. This pamphlet deserves the due consideration of those surgeons who insist upon making the external incision rather than inviting a specialist to attempt endolaryngeal procedure; for if the surgeon be skilled in intra-laryngeal manipulation, it is a matter of certainty that he will attempt that method first; and, in all probability, with sufficient promise of success to cast the external procedure entirely out of consideration.

Bruns's monograph is a calm, unbiased discussion of the question as to the propriety or impropriety of external incisions in cases of intra-laryngeal neoplasms; and the various points at issue are fairly presented from the mooted standpoints respectively. As elsewhere summed up by the writer, Bruns concludes substantially that thyrotomy is not a difficult operation, nor one necessarily menacing to life, but it greatly endangers the integrity of the voice; that it should not be performed until after failure by a skilled laryngoscopist to remove the neoplasms by the mouth; that incisions through the thyroid cartilage between the vocal bands should always be avoided, if possible, on account of its resultant injury to the voice, and the attempt to be made to get along with simple incision of the crico-thyroid membrane, or with the further division of the cricoid cartilage, and, if requisite, the upper ring of the trachea; that in urgent cases, threatening asphyxia, tracheotomy should be performed as an initial measure, and attempts be made subsequently to operate through the mouth, or, if these attempts fail, to operate through the wound, extending the incision to the lower border of the larynx if necessary; and that in cases of malignant growth, especially carcinoma, either operation is injudicious. These conclusions have received almost unanimous endorsement from those whose practice has afforded them opportunities to operate by both methods.

Stoerek's chapter on "Morbid Growths in the Larynx" is an exceedingly well illustrated one of thirty pages, largely dependent on his own extensive and exceptional experience. Exceptional, because he gives a list of sixty instances of morbid growth removed by him at the first attempt, either immediately after detection or shortly thereafter. He divides his subject into Connective-tissue Tumours and Carcinoma, discussing under the former head only papilloma, myxoma, fibroma, and enchondroma.

Stoerck has certainly devised some admirable instruments for intra-laryngeal surgery; not the least valuable of which are his rigid wire-snare, and his excellent guillotine, with which, in some of its forms, he performs most of his operations.

Mackenzie's Sections on "Tumours of the Larynx," comprise fifty-two pages of his volume, giving a condensed history of the subject, and following in the systematic manner adopted throughout. He distinguishes papilloma, fibroma, myxoma, cyst, angioma, and lipoma among the non-malignant tumours, and includes carcinoma and sarcoma in the malignant group. The subject matter is well-condensed, clearly presented, and illustrated with excellent wood-cuts. This chapter, in fact, is a model chapter, presenting less discursiveness than the similar chapters in the other volumes before us. Mackenzie, while operating occasionally, like others, with all sorts of instruments, does most of his work with two kinds of forceps—the common laryngeal forceps, and the tube-forceps; a cutting surface being supplied to some of the common forceps, so as to pinch off those growths which cannot be removed by evulsion without the exercise of force.

Mackenzie fully endorses the conclusions of Bruns as to the propriety and impropriety of extra-laryngeal operations in these cases. Indeed, Bruns's views were much moulded by the suggestions offered by Mackenzie in his well-known monograph on "Growths in the Larynx."

While Voltolini's method of rubbing soft growths away by the attrition of the sponge probang is mentioned, we find no allusion in any of these volumes to a device of Dr. Edward Löri to remove laryngeal growths by means of catheter-polypotomes. These instruments are metallic catheters, with their eye-holes located at various positions around their distal extremities. In this way, a series of instruments will afford the opportunity of sweeping any accessible portion of the surface of the larynx. The edges of the eye-holes are sharpened so as to cut through any soft morbid growth which may become caught within them. As these instruments cannot inflict any injury to the laryngeal walls, and do not impede respiration during their employment, it is quite possible that Dr. Löri has made an important contribution to laryngeal surgery.

Nineteen cases of extirpation of the larynx are tabulated by Mackenzie in his original volume, and twenty in the German edition; to which may be added the remarkable case recently exhibited by Caselli to the International Laryngological Congress at Milan, and the cases of Lange and Gerster, of New York, reported in the *Archives of Laryngology*, Nos. 1, 2, and 3. While it is true that a few patients have lived a number of months after this serious operation, with one or two results exceptionally even better than that, it is no less true that some of the patients operated upon have succumbed within a very short period to the violence actually ensuing from the operation; and it is probable that some cases, in apparently suitable subjects, live longer when abandoned to the onward progress of their malady than they stand a chance of living after submission to the operation. It is impossible to state at present whether this operation will ever become legitimized in surgery. Its sanguine promoters may possibly be able to so minimize the risks and improve the after-condition as to render resort to it fully justifiable under proper circumstances.

Neuroses of the larynx, especially paralyses of motion, have been most minutely studied since the introduction of laryngoscopy as a means of diagnosis. Unilateral paralyses, due to pressure, are not unfrequently

detected as the principal indication of aneurismal and other tumours in the thorax, and their recognition laryngoscopically is occasionally the sole element of diagnosis. Bilateral paralyses, often indicative of disease in the cerebrum, in their turn sometimes direct attention to the true source of an obscure malady. Even plumbic poisoning has been detected solely by laryngoscopic recognition of bilateral paralysis of the dilating muscles of the glottis, which, in their functional activity, may be likened to the functional activity of the extensor muscles of the extremities. For many years this subject of neuroses of the larynx has received the closest attention at the hands of Mackenzie, whose journal articles on the subject, and whose monograph on "Hoarseness, Loss of Voice, etc.," are well known to the profession. The nomenclature adopted by him in designating certain muscles of the larynx as abductors, adductors, tensors, and relaxors of the vocal cords, has been so generally endorsed that the various paralyses are usually described as paralysis of this or that abductor, adductor, etc., rather than as paralysis of this or that muscle.

In his recent volume Mackenzie has made a step in advance in studying laryngeal paralyses from the anatomical region of their origin instead of that of their manifestation. Thus he divides this subject into paralysis from disease of the medulla oblongata, which he defines as "paralysis of some of the muscles of the larynx, and usually at the same time of some other muscles of the head, face, or extremities, indicative of central disease of the nervous system;" paralysis from disease or injury of the spinal accessory nerve; paralysis from disease or injury of the pneumogastric nerve; paralysis from disease or injury of the superior laryngeal nerve; paralysis from disease or injury of the recurrent nerve; paralysis of individual laryngeal muscles; and mixed paralyses.

There are many other topics of deep interest to which reference might have been profitably made, but as it would have protracted this article beyond its projected length, such a selection has been made as seemed likely to be of the greatest interest to the reader. J. S. C.

ART. XX.—*A Treatise on the Practice of Medicine for the Use of Students and Practitioners.* By ROBERTS BARTHOLOW, M.A., M.D., LL.D., Professor of Materia Medica and General Therapeutics in the Jefferson Medical College of Philadelphia, etc. etc. 8vo. pp. 853. New York: D. Appleton & Co., 1880.

THIS systematic treatise on the Practice of Medicine will attract attention at the present time for several reasons, amongst which we would name those which occur most forcibly to us, viz: Its author is widely known and the work already done by him is highly appreciated for its intrinsic value; he has written a book on *Materia Medica and Therapeutics*, which is deservedly esteemed and which has become the text-book on this subject of many of our best medical colleges; he has written a work on "*Hypodermic Medication*," which is properly in the hands of every general practitioner; he has contributed an able essay on a wide-spread and troublesome affection, *i.e.*, "*Spermatorrhœa*," to which we gladly accord praise for its thoroughness and its fitness to supply a want; he comes to us from our Western country

with the honours of a successful practitioner and of a prominent and distinguished professor. He tells us in the preface to his work that he has had ample opportunities of study and research in the territorial acquisitions of our country, as well as in the South during the war; and he has taken care at different times of most of the forms of disease of which he speaks in his work, and, therefore, appears particularly fitted to write a systematic treatise on the Practice of Medicine.

As a marked characteristic of this work we notice Dr. Bartholow's aim to be positive. He believes, and perhaps properly, that one of the hindrances towards accurate and healthful teaching, lies in the spirit of widespread scepticism of the present time. He wishes that definite views in regard to the use of ordinary medicines should be inculcated. And whilst he admits that in upholding this doctrine one may appear at times dogmatic, nevertheless this fault is far less regrettable than the antithesis of grave uncertainty. Science may change, it is true, in a brief period, and those opinions we hold to be true at present, may soon become doubtful, yet we should express ourselves decidedly until contrary convictions prevail, and whenever a change takes place it will be time enough to modify our affirmations. There is much force and propriety in these views which doubtless have been reached by close observation of the evil consequences which frequently arise from lack of faith in the agents at our command for the relief of suffering and the amelioration of morbid conditions. Too often we have ourselves seen the bad results of instruction of an opposite character. Many professors of medicine permit their wavering to become known to their students, and the uninformed intelligence is too apt to overstep the bounds of legitimate action. The accomplished and thoroughly trained teacher will naturally encounter many exceptions to every law, even the most perfect, and will, therefore, become conservative with increasing years. But the beginner who catches and retains first impressions so indelibly, requires to be told the essential points which should guide him and not have his mind and courage affected by a knowledge of special conditions and circumstances which will unduly influence them. As years pass and greater light is afforded him, he will wisely make the part of each erring quantity, but in the beginning such knowledge would inevitably warp his judgment and lessen his well-directed zeal.

With respect to microscopical research, as to the knowledge of gross morbid lesions as observed in the dead-house, whilst Professor Bartholow has been a close observer, he wisely brings to his aid in the formation of his opinions the expert judgment of others. In this department the Germans have undoubtedly led the van in the medical world of our generation. No author can, therefore, properly ignore their discoveries, nor fail to teach students in these branches the acquired results of their arduous and profound investigations. Our author has not been willing to rely merely on his own knowledge from actual observation. He has wisely and prudently sought to make known the best current pathological information. To do this he has been willing to state not only the sources from which he has taken many of his statements, but has maintained the high level of his instructions by not altering the tenor of quoted opinions by interpolations of his own. Few clinical teachers can be perfect in their knowledge of pathological anatomy through their own practical work. There may have been a time when they passed many hours of each day in the laboratory, and when microscopical researches were their most absorbing and attractive study. Once they have become wedded to the calls of a large

private and hospital practice; to the duties of a professorship; to the labours of authorship—this day has gone by. They can only remain the clear and appreciative translators or interpreters of new and excellent work accomplished by others in a special field of inquiry, and it ill-becomes any one to ask or expect more from them. In Dr. Bartholow's work we find that many of his illustrations of pathological changes are borrowed with due acknowledgment from the admirable and graphic plates of Thierfelder. None better could be taken. They are faithful to nature, and executed in the best possible manner. They are, therefore, the ones we most cordially endorse.

Our author was greatly influenced in the preparation of his *Practice* by the advice of many friends and admirers who desired him "to prepare a volume which should have the practical characteristics, the definiteness of statement, the conciseness, and at the same time the fulness of the work on *Materia Medica* and *Therapeutics*." To show somewhat in detail how well he has accomplished the task which was thus set before him, is what now remains for us to do.

Before entering upon it we cannot forbear to remark that his friends have been to a certain extent unjust to our noble art. It is as unreasonable to expect of the *Practice of Medicine* as a whole, the definiteness which has been reached by some of her allied, or accompanying sciences, as it would be to require one of the leading electricians of our day to lay down fixed laws for the application of electricity to lighting our streets and our dwellings, because it is already known that a certain kind and distribution of wires, batteries, etc., etc., are certainly required to answer the intended purpose.

There are two points in the table of contents to which we would direct attention: the first is the fact that there is no mention of a chapter on general pathology, such a one in fact as is usually found in works of this character. Thus the reader is forced to make his own definitions of disease and health; of principles and practice; of the symptomatology of disease; of morbid processes and their relations; in fine of all matters with which the well-informed practitioner is already familiar, but the student certainly is not. This has been left undone for the reason that such topics, though valuable in themselves, are too often passed over hastily or not read at all; which is insufficient it seems to us for abandoning the very groundwork and root, as it were, of all correct thinking and acting in medical practice, still more so when we find that the author has incorporated just this sort of writing in its "proper relation with individual diseases," and as he himself recognizes "at the disadvantage of some repetition." What should we think of a medical man who has only the knowledge of disease which pertains to special cases, no matter how accurate this is? Is all generalization to be thrown aside in order to economize space and time? Are students and practitioners' intelligences to be limited and confined to some well traced groove? Where is the beauty and attractiveness of medical science to be found if not clearly traced to the movements of the mind which point, and with exactness, the manifold features of approximation, or divergence between pathological processes as they are evolved insimilar, or widely different organs? No, it is a mistake to abandon in our works on *Practice of Medicine*, or of *Surgery*, the grand results which are the outcome, as it were, of the united thought of physicians of all times and countries, and which enable many a practitioner when in doubt to attach the case under observation to a series or class of which the broad outline stands forth prominently in his intellectual vision.

To these remarks it may be answered that the author has the privilege of limiting his own work as he deems most advisable, and in view particularly of the size and extent of his work and of the desires of those who are most interested in its success. We are informed that, at the time the author had in view the near publication of his Treatise, there was an evident demand for a one-volume Practice of moderate bulk, which should be very practical in its teachings, avoiding the discussion as far as possible of all mooted or unresolved questions, and leaving almost entirely to other and larger works the consideration of the general principles of medicine, thus retaining more space for the due consideration of the several subjects of special practice. We admit the force of these reasons, but we consider our previous remarks none the less timely from a wide professional standpoint.

We shall hope, in a future edition of Dr. Bartholow's work, to see the customary introductory chapter on the Principles of Medicine restored. Let it be short, if it be still thought judicious to economize space, but let it in any event be added. A criticism somewhat similar might be made in regard to the nomenclature, as well as to the classification of diseases. We regret very much that it was considered wise to omit any consideration of these subjects. It was done with a view of keeping the size of the volume within certain limits, but is none the less an omission which we should be glad to see rectified hereafter. There is nothing more useful to a beginner than to have certain general divisions of morbid processes presented to his mind. He must acquire this knowledge somewhere, and a practical treatise on medicine is, it seems to us, a suitable book in which to give the first notions on this subject.

It would not enlarge the volume much to have a few additional pages in the commencement which would place clearly before the student the separation of general and local affections, and the method according to which the different disturbances of organ or structure are taken up and studied successively. Even young students must be impressed constantly with the advantages which are inherent in a well-arranged system. Order there may be in the author's mind, but it should be, also, always apparent to his reader. Unless the latter is already well informed, he must trust the former to make divisions for him; he cannot properly do it himself. For these reasons we are sorry that Dr. Bartholow dispensed with chapters and abbreviated sections as much as possible, for in this condensation a loss—and a valuable one—has been incurred. Doubtless, in a future and, we hope, somewhat more extended edition of his work, this slight blemish will cease to exist.

This work of Special Pathology and Therapeutics commences with Diseases of the Digestive System, and excellent descriptions of Stomatitis, Glossitis, Gangrene of the Mouth, and Catarrhal Inflammation of the Naso-pharynx and Lower Pharynx, etc., follow in rapid succession. The symptoms of these affections are accurately and clearly described, though with a regard for brevity that the terms upon which the entire work has been produced rendered necessary. Here, as elsewhere throughout this volume, a constant desire has been shown to suppress all useless verbiage whilst giving all essential points of knowledge. To assert that the author has always been able to accomplish this would not be in accordance with the truth. At times he has omitted a symptom it would have been proper to mention, and this no doubt has been occasioned by his aim to be terse. For a similar reason his passages at times are abrupt in their laconicism,

and do not read as smoothly and agreeably as one would prefer. When we consider, however, the immense number of facts, opinions, citations, etc., that the author of this work was forced to condense in a somewhat limited space (pp. 853), we must accord praise rather than criticism for the studied manner in which it is done. All considerations of symptoms and diagnosis tend with our author towards what to him is evidently a most gracious task—practical, and frequently his own, views of treatment.

His description of catarrhal inflammation of the naso-pharyngeal mucous membrane shows a just appreciation of an important affection. He does not pass it over in silence as many writers on practical medicine have hitherto done. Neither does he content himself in giving general remedial measures, which, however well selected, are almost always insufficient to effect a cure. On the contrary, several formulæ are given for local applications that he has found valuable in practice. As to the etiology of this troublesome affection, he considers tobacco and spirituous liquors to be important factors of its production. He therefore insists that habits of drinking and smoking shall be given up. The opinion of Bartholow is more radical on this subject than we believe is essential after extensive experience in the management of this affection. It is a safe and excellent plan, however, for the general practitioner to follow, inasmuch as there are many cases which are considerably aggravated by excessive indulgence of a vitiated taste. Indeed, we have remarked that tobaccoists prove to be in many instances obstinate cases of this affection, and at times their pituitary membrane shows quite deep ulcerations. We approve highly of Dr. Bartholow's condemnation of the nasal douche, and believe, for the purpose of freeing the mucous membrane of the inspissated or fetid secretions, the post-nasal syringe is preferable, although not as absolutely free from harm as the spray producers of Sass. We are more than pleased to know that the author finds that dry applications are greatly superior to other modes of treatment.

The treatment of so important a topic as that of stenosis of the œsophagus does not appear properly disposed of with the following remarks: "So far as medical management is concerned, it is determined by the causes of the obstruction, and it is not our province to discuss surgical expedients." As the student has not yet become familiar with the treatment of syphilis by anything mentioned by our author, and, if he had, as it is not mentioned *at all* as a cause of stenosis of the œsophagus, the good and often brilliant results frequently obtained with the use of iodide of potash would evidently be absolutely ignored. This subject should have been left in the domain of surgery where it properly belongs, or it should be spoken of fully enough to permit the student to treat a case in a suitable manner after its perusal.

The difficulties pertaining to a proper nomenclature of inflammatory affections of the stomach are considerable, and yet we do not believe the subject is at all simplified by applying the term "acute gastritis" to severe affections which offer but few phenomena of inflammatory change. Notably we are having in view the affection known by the French as "*embarras gastrique*;" and here we may say that this disease, contrary to what Professor Bartholow affirms, is usually accompanied by a manifest febrile movement. We do not altogether like the term "*gastric catarrh*" for such cases, as it has been a much abused one, but it will at least, if used with discrimination, allow the mind to be better satisfied than by

employing an evident misnomer like "acute gastritis" for conditions which are often so badly defined that post-mortem revelations do not in any way corroborate an opinion expressed before death. In cases of so-called acute gastritis, Bartholow recommends "a mixture in equal parts of carbolic acid and iodine tincture, of which a drop may be taken, well diluted with water, every few hours, as a most valuable remedy to arrest abnormal fermentations and to check vomiting."

In speaking of the causes of chronic gastric catarrh, we have noticed the omission of all diseases which obstruct the portal or abdominal circulation—such are pulmonary emphysema, chronic affections of the cardiac orifices, and notably cirrhosis of the liver. It is true that, at the beginning of treatment, the author in part rectifies this, but then merely to add that its management "need not be considered here." As a method of treatment, the highest importance is attributed to the "skim-milk cure," which is described with some detail, and to washing out the stomach by means of the stomach-pump or fountain-syringe.

He attaches great value to the use of arsenic in the form of Fowler's solution, and pleads strongly for *rest* to the stomach as necessary when it is suffering. Hence the need of a wisely regulated diet. In the differential diagnosis of atonic dyspepsia from chronic gastric catarrh we would have liked to see the absence of pyrexia and thirst of the former disease dwelt upon, and also the pale, broad, flabby tongue, which presents no signs of irritative action. The articles on ulcer and carcinoma of the stomach are excellent, and the indications for treatment are valuable and full. We are glad to notice that rectal alimentation by means of defibrinated beef blood, the recommendation of which is due to Dr. Andrew H. Smith, of New York, is insisted upon. Here, however, we are called upon to throw out a word of caution, as we have seen one case in which death appeared to have been hastened somewhat by large quantities of partially changed beef blood which had accumulated in the form of semi-solid masses in the cæcum. A mild occasional cathartic enema would avoid danger from such a source.

Short chapters are given on proctitis and periproctitis (catarrh of the rectum), and the analogy is referred to between these diseases and similar conditions of the cæcum. Proctitis, when occasioned by obstinate constipation, should be looked upon as the mildest form of dysentery. In severe cases there is danger of abscess forming around the rectum. We should suspect and be on the lookout, under these circumstances, for a dyscrasic influence in the economy, such as tuberculosis, which if discovered, would decide for us the estimate in which the local conditions must be considered. In speaking of the treatment, it is regarded as "a most serious mistake to employ astringents and anodynes with a view to quiet the straining at stool." On the contrary, the bowels should be thoroughly evacuated by means of Epsom salts, which is supported strongly as the safest and most efficient agent for the purpose. The sections on dysentery, ulcers, and obstruction of the intestines, are clear and satisfactory, and show that the author's bibliographical knowledge has kept fully abreast of the times.

Amongst the various complications of dysentery, the author, of course, speaks of abscess of the liver, and in this connection we have been struck with his remark stating that this sequela is occasioned by the milder rather than by severe forms of ulcerative colitis. The explanation of this fact given, is "the destruction by gangrene, and the rupture of vascular

communication which takes place in the latter." In puerperal dysentery the utility of ipecac is specially insisted upon, as the author has seen some remarkable cures follow its exhibition. He claims, however, justly as it seems to us, that more than twenty grains at a dose are rarely necessary in our temperate climate.

In one case of obstruction of the intestine we had under our care about two years ago, the greenish coloration afforded by calomel stools enabled us to decide that a passage may have been made through the bowels, when, prior to this evidence, we had remained in a state of grave doubt and apprehension. We, therefore, hold contrary to Bartholow, that there is some virtue in this remedy, and that it is not employed "to the injury of the patient" but rather to his decided advantage.

We pass over diseases of the peritoneum and pancreas, and arrest ourselves but a moment with diseases of the liver. We bear testimony to the author's appreciative sense of good work of others when he cites the experiences of Cameron, Condon, and Sachs, in puncturing the liver with the aspirator needle in cases of abscess. There would appear to be little doubt in view of their statistics that this method is greatly superior to the antiquated one "of using the knife or trocar when the abscess was already pointing." In the latter we have 66 deaths in 81 cases (Waring); in Sachs's collection of 21 cases there were 8 recoveries after puncture, which represents a much larger per cent. The figures (11 and 15) representing the area of dulness in cancer of the liver, and a liver enlarged by hydatid cysts are rather poor delineations from which to point out any differential signs of value. Certainly the free margin of the liver in Fig. 11 gives a very erroneous notion to the student of what usually exists, the fact being that the cancerous masses when felt, are much more palpable over the anterior surface than along the free border. Under the title of catarrh of the bile-ducts reference is wisely made to the importance of this affection viewed in the light of recent knowledge as to the ease with which the hepatic parenchyma becomes affected pathologically through its persistent and repeated influence (Charcot, Legg). The remedy which, above all others, has the power of effecting the solution of biliary calculi, according to Bartholow, is phosphate of soda. This salt he gives in drachm doses, three times daily, and "success seems always to attend this practice."

We might, perhaps, take exception to the author's wish to constitute true leucocythæmia a disease in which the relative proportion of white to red blood-corpuscles should be reduced to one to six. We have had two cases under our care during the past twelve months, one in an adult, the other in a girl 8 years old, in which no such approximation was found. In both of our cases the spleen was much enlarged, although the normal form was in great measure preserved, and the lymphatic ganglia of the neck, the groin, and, in one instance, of the axilla, were implicated to a remarkable extent. The only remedy which appeared of the slightest use was injection of Fowler's solution (without the colouring substance) into the intimate tissue of the enlarged glands of the neck. In the child we reached the quantity of eight drops at one injection, which was several times repeated at intervals of four days, without notable local reaction. In speaking of progressive pernicious anæmia, we would expect a word, at least, of reference to Biermer (1871), who christened this form of malignant anæmia. Nor would it have been out of place to have mentioned the article of Dr. William Pepper, in the *American Journal of the*

Medical Sciences, October, 1875, in which it is fully shown how Addison, twenty-four years before, published an account of what appears to be an entirely similar disease under the name of "idiopathic anæmia." In this affection there were similar symptoms, such as dropsy, weak circulation, and hemorrhages from different organs. There was no manifest enlargement of lymphatics, and no increase of leucocytes in the blood, but there was great diminution in the number of red globules. It is proper to add, however, that at this period no careful and accurate examination of the marrow of bones had been made. This has since been thoroughly performed by Ponfick, Wood, and others, in certain forms of pseudo-leukæmia.

The illustration to face page 228, modified from Rüdinger, which is intended to show the relation of the valves and orifices of the heart to the ribs, sternum, and external surface of the thorax, is not accurate. The figure showing a section of the heart is especially faulty, since the apex of the heart is represented as beating in the sixth intercostal space. In the other illustration one is obliged to know in advance where the orifices and valves are situated, because there are no figures and no descriptive text to give this information.

Diseases of the heart are treated of in fifty-nine pages, of these, ten are given to pericarditis, upon which subject there is an excellent chapter. We are glad the author refers favourably to the operation of puncture of this sac in instances in which the effusion is very large or purulent. Of course, such interference must not be undertaken hastily, nor with insufficient reasons, but we are of opinion that Dr. Roberts, of Philadelphia, has done good service in bringing this subject prominently before the medical profession by his able essay in regard to it. The sign of pericardial adhesions, upon which Bartholow, with others, lays great stress, *i. e.*, the depression synchronous with the systole of the heart at the place of the apex beat, we are compelled to regard as doubtful. In more than one instance we have been on the lookout for it and have failed to discover it, and yet, after death, the adhesions were found to be extensive and of long standing. Happily, our author states further on, that the absence of this sign should not negative the existence of the morbid condition referred to.

In regard to the termination of chronic endocarditis Bartholow is eminently correct in the belief that examples of a *cure* of actual lesions is very infrequent. In regard to the diagnosis of ulcerative endocarditis, we consider it scarcely warranted to assert that this disease cannot be differentiated from typhoid fever by the symptoms. We may at times question its presence when it really exists, as the autopsy afterwards plainly shows, but usually such instances have been freed from the suspicion of being examples of typhoid fever. Diseases of the valves and orifices are well considered, and we uphold the author strongly when he agrees with Flint that "some murmurs have no pathological nor clinical significance." His remarks in regard to the nature, origin, and time of growth of digitalis employed, are pertinent, and should be carefully considered by any one who makes frequent use of this remedy. The section on palpitation of the heart, which concludes this chapter, is too brief to give an adequate picture of an important functional disturbance. On the contrary, the section on diseases of the bloodvessels in aneurism of the aorta is very commendable in its fulness and its discussion of several mooted points.

In speaking of the treatment of pleurisy, our author wisely protests against the use of mercury in serous inflammation, and here goes counter

to the late German view which finds its expression in Ziemssen's Cyclo-pædia. We can scarcely agree with the author when he says that in the sero-fibrinous form of pleurisy thoracentesis ought not to be performed within a few days after the period when effusion is recognized, nor indeed whilst the exudation is augmenting, unless the symptoms be those of excessive compression. Such a line of treatment, if strictly adhered to, would, in our opinion, be of frequent detriment to our patients, as we have elsewhere shown. We hold that there are no valid objections to the puncture of the chest walls with the needle of the aspirator so soon as a moderate amount of liquid is recognized in the pleural cavity, and we furthermore believe that this operation always places the patient in condition to resolve with greater certainty and rapidity whatever of effusion may remain behind, or re-accumulate in the chest cavity.

The term "cardiac failure" in pneumonia usually means for us the formation of heart clots prior to death. These clots were given their true significance many years since by Grisolle, and we do not perceive any progress in ignoring their immediate and fatal consequences. To go so far as Juergensen in reducing temperature by exposing a patient with solidification of lung tissue "naked to cold air," seems to us an evidence of human folly. No one, we claim, can read the admirable researches of Wunderlich on temperature in acute diseases, and not be struck with the important fact that high temperatures do not always produce morbid effects alike either in character or degree. The sources and mechanism of rise of temperature are not yet accurately determined, and assuredly no hazardous methods should therefore be employed to lower it.

The three forms of pulmonary consumption now generally recognized, *i. e.*, the caseous, tuberculous, and fibroid, are clearly described, and will repay perusal.

The most effective remedy to arrest hæmoptysis is the hypodermic injection of ergot. This, as the author states, will often arrest very considerable bleeding when other means have proved to be of little or no avail. The sections on Emphysema of the Lungs, Acute and Chronic Bronchitis, are all well up to date, and here and there we note a few points which have an air of novelty. In regard to the pathogeny of asthma, "as asthma is a neurosis, there are no anatomical changes peculiar or essential to it." Such was, indeed, the opinion of Hyde Salter, but the later experiments and teaching of Berkart would seem to show that the instances in which it should be so regarded are so infrequent as to become questionable. Almost invariably some accompanying lesion of greater or less importance is discovered by attentive examination which shall suffice to explain all the spasmodic symptoms, and place them in the relation of an effect to a known cause. Bronchial catarrh and emphysema are not, we think, as Bartholow writes, "sequels and results," but are an integral factor of the disease, from which it cannot be disassociated, because when and where found they are also essential to its presence.

"There is no medication," according to Bartholow, "so effective as the hypodermatic injection of morphia." Our author believes that "the application of medicated spray may be sufficient of itself" in the treatment of chronic laryngitis. Croupous laryngitis he considers "a purely local affection," and that it never causes systemic poisoning. In the treatment of chronic parenchymatous nephritis we consider the author shows considerable medical acumen in the following statement: "The choice of diuretics is restricted to those which do not increase the blood pressure in

the kidneys—as the free imbibition of fluids, milk, bitartrate of potassa solution, etc. The infusion of digitalis, notwithstanding the theoretical objections to it, is often very serviceable in exciting free diuresis.”

We are glad the author mentions Da Costa and Longstreth's admirable researches on “The State of the Ganglionic Centres in Bright's Disease,” in which it is clearly shown that the renal ganglia undergo fatty degeneration and atrophy, and that there is a probable causal relation between this lesion and the renal affection.

The following statement of Bartholow is worthy of note, and to us seems very probable: “The author has maintained for many years that interstitial nephritis frequently follows gonorrhœa in consequence of the injurious action on the kidneys of the oils and balsams used in its treatment.” Previously, it has been considered, by well-known German authorities, that the causal relation between gonorrhœa and nephritis exists, but they explain the secondary affection by an extension of the catarrhal process from the bladder to the kidneys. This article is a very excellent one, and the statements in regard to treatment well worth recording. Under this head our author writes: “The convulsions and nervous phenomena of uræmia are best remedied by the means for procuring elimination, but, if the symptoms are urgent, the inhalation of amyl nitrite, chloroform, and ether may be necessary. The hypodermatic injection of morphia in large doses has been shown by Loomis, of New York, to have a remarkable influence on the convulsions of uræmia; but chloral by the stomach or rectum may be better;” and a little further on he states that “Recent observations by Drs. Sparks and Bruce, in respect to the influence of diet, rest, and exercise on the excretion of albumen, have led to the following results: the amount of albumen is much reduced by a milk diet and non-nitrogenous food, and absolute rest remarkably reduced the volume of albumen.”

In the treatment of pyelitis, whether it be the result of the presence of renal calculi, or due to some other cause, Bartholow recommends highly the internal exhibition of eucalyptol, or the fluid extract of eucalyptus. To acidify the urine when there is reason to believe that the renal calculi present are entirely composed of phosphates, or only inclosed in a phosphatic outer layer, he knows of no salt that will accomplish this more speedily, and maintain the urine in this condition better than the benzoate of ammonia.

Professor Bartholow devotes one hundred and sixty pages to the consideration of diseases of the nervous system. First, he takes up affections of the Brain and Cerebral Meninges, then of the Medulla Oblongata, the Spinal Meninges and Cord; then the Cerebro-spinal Neuroses, in which are included epilepsy, hysteria, catalepsy, paralysis agitans, chorea, writer's cramp, and tetanus; finally, Diseases of the Peripheral Nerves, in which are apparently included angina pectoris and exophthalmic goitre. For the reason that Dr. Bartholow is President of the American Neurological Society, and has devoted much of his time to the study of, and practice in the foregoing diseases, we would naturally expect to glean many facts of interest and more or less novelty from its perusal. Our author follows Jaccoud's division of the three well-marked forms of cerebral hyperæmia, viz., the *light*, the *severe*, and the *apoplectic*. In regard to treatment, he strongly urges that an abstemious life shall be followed, and especially should alcoholic stimulants and powerful emotions be avoided. He adds, however, that “in making these suggestions the author

wishes his readers to note that he regards protracted rest to the mind as often injurious, and that light mental occupation is preferable to an entire disuse of the faculties."

In the treatment of cerebral anæmia, and when alarming depression is due to hemorrhage, the author overcomes it, among other remedies, by the intravenous injection of ammonia.

The author's section on Cerebral Hemorrhage is well and clearly written, and shows familiarity with the late acquisitions to our knowledge of cerebral localization. We would like to know the authority for the following statement, inasmuch as it is in direct opposition with the doctrine taught this winter at the Clinic for Nervous Disease of the College of Physicians, New York, by Professor E. C. Seguin, viz., "Boucharde's explanation that the *rigidity* [meaning "late rigidity"] depends on the atrophic descending changes in the cord has been disproved, and a satisfactory explanation remains to be given." Under the head of treatment the author recommends the use of the tincture of aconite root, one drop every two hours, beginning with it immediately after the coma has passed off. When the period of reaction has passed, carbonate of ammonia and spirit of Mindererus can accomplish much if given during a month or more, or until the retrograde changes of the blood-clot have terminated.

In the treatment of acute meningitis the author has seen the best results follow the use of tincture of aconite root (gtt. ij) and deodorized tincture of opium every two hours during the period of excitation. If there be much cerebral excitation he adds to this combination one drop of the fluid extract of gelsemium. He most decidedly condemns the practice of severe and protracted counter-irritation so often pursued in cerebral maladies. Lugol's solution is especially serviceable in the tubercular form of this disease.

A few words on general maladies and we shall sum up this review. In a note, page 704, apropos of typho-malarial fever, the author writes as follows: "By this term is meant typhoid fever in a malarial subject. In consequence of the existence of a malarial infection the symptomatology of typhoid fever is modified, the chief deviation from the usual thermal line consisting in the greater excursions of the daily temperature. This modification of the fever has long been known by all well-informed physicians practising in malarious regions." After stating that he does not believe that the morbid anatomy of typhoid and typho-malarial fever differs materially, he continues: "Typho-malarial fever has, then, no reason to be admitted as a morbid entity in nosological systems—does not in fact exist. All that can be claimed for it is, that when typhoid fever occurs in an individual saturated with malaria the fever is modified somewhat in its course, has more of the remittent type, and is apt to be protracted, owing to the occurrence of intermittents during convalescence."

The foregoing remarks we have reported *in extenso*, as they are, in our opinion, eminently judicious and timely, since we would be glad to see the term typho-malarial fever dropped from our catalogue of fevers having a distinctive type.

The section on diphtheria is one of the most complete in this treatise. Under the head of local treatment the author believes in mopping out the fauces with a solution of lactic acid, or in using the same acid in a still more diluted form in a syringe, and cleansing by this means the nasal passages. After the employment of the lactic acid solution he makes use of powdered sulphur, projecting it over the affected region by an insuff-

flator. The treatment of the systemic condition is equally important, and should meet two principal indications—"to limit the spread of the local disease, and to prevent systemic infection." The first object is accomplished with bromide of ammonium (two to fifteen grains every three hours); to prevent systemic infection liquor iodinii comp. is administered, one to five drops every four hours.

The other chapters which terminate this treatise appear to us of equal value with those we have already criticized.

The therapeutical part of this Treatise is certainly its most important feature, for it is in the manner this is taken hold of and developed that we find its stamp of individuality. Generally speaking, the remedies are well chosen, and, in doses, combinations, and opportunity of employing them, the author is an excellent guide. He particularly favours the hypodermatic injection of morphia, which he regards as an excellent heart tonic, in small doses, and whenever it is appropriately given. Others, like the internal exhibition of *veratrum viride*, he speaks of frequently, but never with very high praise, and with some cautionary hints.

Again, the author has a quiet confidence in the power of drugs, which is well shown in the following citation taken from his paragraph on the treatment of occlusion of the cerebral vessels: "The author has had remarkable results from the following plan of treatment in thrombosis. Carbonate and iodide of ammonium (ten grains of the former and five grains of the latter) are given three times a day, in a suitable vehicle, for several months, usually the object being dual, to increase the action of the heart and arteries, and to effect a solution of thrombi forming by maintaining the alkalinity of the blood." Now even granting the correctness of the diagnosis, which almost always must be one of very doubtful kind, are there many well-informed practitioners who could to-day share this conviction? We doubt it. One must see effects produced first in diseases which are thoroughly well understood, and easily recognized, before one can trust to recognize brilliant results in cases in which the symptoms of disease are always most difficult to separate from one another, and where, as a consequence, any remedy may at times seem to do great good, and yet really be completely inert.

We doubt not that Bartholow's book will become popular with students on account of its clear, practical teachings, but to the well-informed practitioner it will be found disappointingly brief in many particulars. In its numerous chapters, on treatment of special diseases, it will undoubtedly give him many points that afterwards he can daily utilize in his ordinary rounds. This work is not an exhaustive treatise; it is far more than a simple manual. Its best *raison d'être*, as far as we can perceive, is to protest strongly against the growing, and almost overpowering, therapeutic nihilism of the present time. To this task the author brings much accumulated knowledge, the product of long training, study, clinical experience, and especially an enthusiastic belief in the efficacy of drugs. To many members of our profession his voice in this direction will be of service, for it will animate their efforts, and make them more hopeful in face of dreaded forms of disease.

We hope that when another edition is called for, as we have no doubt speedily will be, the author will earnestly endeavour that his good work be not too much condensed in order that time and space be economized, but rather that he will so expand his treatise as to obtain that sum of great and lasting praise which belongs to those who do work, not for the present time, but for a posterity of long duration.

B. R.

ART. XXI.—*A Practical Treatise on Tumours of the Mammary Gland; embracing their Histology, Pathology, Diagnosis, and Treatment.* By SAMUEL W. GROSS, A.M., M.D. Surgeon to, and Lecturer on Clinical Surgery in, the Jefferson Medical College Hospital, etc. etc. 8vo. pp. xi., 246. New York: D. Appleton and Company, 1880.

THE scientific classification of tumours so clearly presented by Virchow in 1863, in his comprehensive and masterful treatise on the subject, has served as the basis of all later studies in this direction. As its influence began to be more widely appreciated, the practical value of an exact knowledge of the structure of neoplasms became so evident, that physicians as well as surgeons felt that an education which gave them no opportunities for recognizing the differences in the histology of tumours was, to say the least, faulty. They were to contribute to the life-history of these excrescences, and their contributions to be of value must be based upon something else than a macroscopic statement of appearances or a microscopic observation of nuclei and cells and fibres. Malignancy and benignity were but extremes in the scale of effects, each degree of which presented a different ratio to the scale of causes. A relatively exact classification had become so essential that without it progress was impossible, and with it the comparatively valueless nature of previous observations was apparent. With the structural classification of tumours began the necessity of renewed studies of their physiology and pathology.

An examination of the standard text-books in surgery and of those relating to the nomenclature of disease shows that a proper appreciation of the value of recent investigations in the subject of oncology has not yet been obtained. It is, therefore, to monographs like the one now under consideration that the physician must look for available knowledge as well as recent advances in the subject of which it treats.

It is well known that "Die Krankhaften Geschwülste" of Virchow has never been completed. That portion of the subject which relates to what are now called the epithelial tumours remains unwritten by him. As this group includes the cancers which have been the very synonym of all that is dangerous and destructive to life and health, it obviously became the field of special study for pathologists. For many years the surgeon with large opportunities for collecting material, has placed the tumours removed by him in the hands of competent investigators, who have added to the value of his labours by conscientious and prolonged study on their part.

Through such a co-operation, and the rare fortunate combination of surgeon and pathologist, the gaps left by Virchow have become narrowed. The study of embryology, of comparative anatomy, of physiology has been found necessary that the proper position among tumours may be given to cancer and other epithelial growths, and the names of prominent investigators in the former subjects have become familiar to those who are more exclusively concerned with the diseases which affect mankind.

The writer who is to generalize must seek his information not only from such sources, but also from the investigations concerning the diseases of special parts or systems of the body, as those relating to the skin, to obstetrics, gynæcology, and to the nervous system. With a knowledge of the results of these investigations, such a work as the present volume must begin, if it is to possess the greatest possible value.

In the classification of tumours of the mammary gland Dr. Gross fol-

lows the plan presented by Virchow, as far as it is available, and then utilizes the results of recent investigators who have treated of the varieties not considered in this plan. Cysts and growths thus include the varieties, although the latter alone are the tumours in the narrow sense. The growths comprise the connective tissue series in which are the fibroma, myxoma, lipoma, chondroma, and sarcoma; the epithelial series including the adenoma and cancer, and the series composed of special tissues of a higher physiological type, viz., the angioma and neuroma.

The mamma is popularly supposed to be the seat of a great variety of tumours, and it is therefore interesting to note the statement of results derived from statistics on this point, based upon the histological examination of tumours by several competent observers. To this series Dr. Gross contributes 136 cases. It appears that of all the mammary tumours, with the exception of cysts, 83.20 per cent. were cancers, and 16.79 per cent. were of a non-cancerous nature. Of the latter, one-half were sarcomata, the others being fibromata, with one adenoma.

The relative frequency of individual tumours, other than cancer, is also obtained from an analysis of 136 cases. From this it resulted that 48.52 per cent. were fibrous, 47.79 per cent. sarcomatous, 2.94 per cent. adenoid, and less than 1 per cent. myxomatous. The value of such a table for diagnostic purposes is sufficiently evident, and, exclusive of cysts, the surgeon is called upon practically to diagnose between a fibroma, myxoma, sarcoma, adenoma, and carcinoma.

In the consideration of the evolution of mammary tumours Dr. Gross gives the results of his study of the writings of many investigators, among whom the names of Waldeyer, Recklinghausen, Billroth, and Lücke are deservedly prominent. It is an important oversight that the studies and generalizations of Thiersch are not referred to, as his work gave perhaps the most immediate impulse to the general adoption of the theory of the developmental origin of epithelial tumours.

The relation of a traumatic cause, as preceding the growth of the tumour, is found by Dr. Gross to apply equally to cancerous and non-cancerous growths. He further learns that the state of the reproductive organs does not predispose to the development of tumours of the mamma, and that heredity exerts its influence in cancers alone, and with these in but one case in nine. The relation of eczema and psoriasis of the nipple and areola, "Paget's disease," to cancer of the breast is discussed at some length, and it is found that these affections were present in 1.44 per cent. of non-cancerous tumours, while they were also met with in 1.03 per cent. of cancerous growths. The experience of Billroth with reference to this subject is not without interest. In his "Diseases of the Female Mammæ," lately published, he states that he has met with but one case where a cancerous breast was found to be eczematous.

The age of the individual proves to be of decided diagnostic importance. The average at which non-cancerous growths appear is stated to be thirty-three years, and before the age of forty most non-cancerous tumours of the mamma are fibrous and sarcomatous. After the age of forty cancers are more abundant, representing 92 per cent. of all tumours of the breast, exclusive of cysts. It would appear from the inspection of the table with regard to the relative frequency of mammary tumours at different periods in life, that Dr. Gross has not clearly stated the inferences to be drawn. Of all tumours before the sixteenth year the statement made is correct, but the relative frequency of tumours after this period till the age of forty is

manifestly cancer, sarcoma, fibroma, adenoma, and myxoma; after the age of forty the order is the same. The obscurity in statement evidently arises from a comparison of the transverse column of percentages, which do not relate to the main question, instead of comparing the number of cases. Although it is true that sarcomas and fibromas are more common at the time of structural perfection of the gland than later, it is also true that cancers are more common at the same period than the preceding varieties.

A table of percentages indicating the relative frequency of each variety of a tumour at a given time of life would have added materially to the chapter on etiology, although this question is answered numerically by noting the relative number of cases of each variety during a stated decennium.

The anatomy of mammary tumours furnishes an interesting chapter. Attention is called to the modifications in appearances resulting from the manner of growth. It is well known that these tumours are very likely to contain dilated ducts and that the contents of these ducts may vary in consequence of secondary changes. Much of the confusion which has arisen in the nomenclature of mammary tumours is due to this combination. Dr. Gross properly calls attention to the importance of recognizing the tissue of the tumour as the essential feature, the dilated ducts being of secondary importance, and they are therefore expressed adjectively. A cystic fibroma, sarcoma, or myxoma is thus a tumour whose manner of growth is such that a combination with dilated ducts is present.

The distinction between cystic, solid, and vegetating varieties as common to various groups of tumours, should be well kept in mind as tending to prevent a diagnosis based upon gross appearances alone. It is interesting to learn that of 120 cases personally examined by Dr. Gross, 50 per cent. were solid, 44.16 per cent. vegetating, and 5.83 per cent. cystic. It is to be remembered that all vegetating forms are essentially cystic, the dilated duct being more or less completely filled with the vegetations. The term cystic is therefore practically applied to those tumours whose dilated ducts contain an essentially fluid material. A cystoid tumour on the other hand, is one in whose solid tissue one or more cavities arise in consequence of pathological changes within the tissue.

The special consideration of the several varieties of mammary tumours possesses great practical interest, and the reader will find much that is important concerning the symptoms and prognosis of each class. He will learn that fibrous tumours may assume a fungoid appearance, that many of them may be accompanied by a bloody discharge from the nipple, and that after a period of quiescent growth they may rapidly increase in size. The skin may even be adherent and the nipple depressed, and the tumour may be firmly adherent to the subjacent muscle, and even to the sternum, without its nature being otherwise than fibrous. There may be lancinating pains also, and in general pain is likely to be one of the symptoms accompanying the growth of this form of tumour. Certain curious instances of what may be regarded as a recurrence of the growth are presented, and it is stated that such recurrence takes place more than once in every sixteen cases.

The description of sarcoma is drawn from a collection of sixty cases, and the section relating to prognosis is particularly interesting. It appears that this form of tumour of the breast is excessively malignant, recurring locally in 61.53 per cent. of all instances, and the growth was found in distant organs in 57.14 per cent. of those cases where a post-mortem examination was recorded.

Dr. Gross admits the great rarity of what may be called adenoma of the mamma, and yet he collects eighteen cases from which he obtains the history of this group of tumours. Many authors would be unwilling to commit themselves so definitely to the position of a growth which so often runs into other well-recognized varieties of tumours. The criterion offered by him is one which can hardly be regarded as diagnostic, as different parts of the same tumour are likely to differ extremely in appearance and structure.

The history of tumours thus classified indicates, on the one hand, that the border line between adenoma, sarcoma, and cancer may be but ill-defined; upon the other, that it is often difficult to distinguish between an adenoma and a diffuse fibroma. There is undoubtedly a mammary tumour, rarely met with, which is best characterized by the term adenoma, yet it is one whose definite position is not to be regarded as absolutely fixed.

The chapter relating to cancer is full of interest, and gives the result of the careful study of 712 cases, all of comparatively recent occurrence.

Dr. Gross is a thorough devotee to the early use of the knife in this affection, and presents figures which tend to demonstrate the efficacy of early removal. In the analysis of tables prepared to show the effect upon life of the removal of the tumour, it is found that twelve months are added to the life of the individual by this operation, and that permanent recovery results in 9.05 per cent. of all cases. A radical cure is assumed in case of no return of the disease, locally or generally, within a period of three years.

It is also stated that recurrence may be delayed, or altogether prevented, if the axillary lymphatic glands are removed with the mamma. It is interesting in this connection to note the statement of Billroth that he has nine patients who have lived from three to twelve years after the removal of mammary cancer, without a recurrence of the disease.

It is obvious to the reader of this somewhat extended notice that the volume now before us is rich in valuable information and suggestion with regard to the treatment of a disease which has till recently held the reputation of being absolutely incurable. The tendency of the past twenty years has been in the direction of maintaining the local origin of tumours, and a secondary infection of the body, instead of a primary dyscrasia or diathesis existing throughout the system.

The practical outcome of this theory, the earliest possible and thorough removal of all parts concerned in the origin, growth, and reproduction of the tumour, has already become firmly established in Germany, and has now found one of its warmest advocates in this country. So enthusiastic an exponent as Dr. Gross will doubtless stimulate his fellow-surgeons to add to their number of early and thorough operations, the results of which in the next twenty years will accomplish much to substantiate or overthrow the views of the present day.

Hospital surgeons may claim that it has been their practice to act in accordance with the suggestions to be found in this volume, but there can be but little doubt that such action will be intensified by the vivid statements and convincing figures from Dr. Gross.

R. H. F.

ART. XXII.—*The Utricular Glands of the Uterus, and the Glandular Organ of New Formation which is developed during Pregnancy in the Uterus of the Mammalia, including the Human Species, etc.* By Prof. G. B. ERCOLANI. Translated by HENRY O. MARCY, A.M., M.D. 8vo. pp. 305. With an *Atlas*. Boston: Houghton, Osgood & Co., 1880.

SUCH is the abbreviation of the title of a remarkable volume on the placenta. Why the book should not have been so named is a question that Prof. Ercolani has not thought worth while to mention. We may suggest a reason: the reader must become acquainted with the author's views at the onset. If the word placenta had been retained in the title the reader might have had lingering impressions of the views of William Hunter, Sharpey, and Bischoff. Prof. Ercolani boldly announces that his views are radically distinct therefrom, and emblazons the outlines of his theorem on the outside as well as the inside of his thesis.

To speak in extenso: Ercolani holds that the nutrition of the fœtus takes place in the uterus by means of a fluid secreted by a glandular organ of new formation. The placenta results from a conjunction of two portions entirely distinct in their anatomical structure and in their function; the fœtal portion, vascular, absorbent, and the maternal portion, glandular and excretory; moreover, that the glandular organ of the uterus wholly departs from the ordinary and known laws which regulate the formation of glands in the animal organism.

The book itself is the reprint of Prof. Ercolani's monographs which have appeared from time to time in the translation of the Academy of Science of Bologna. To these monographs is appended a series of short articles written for a French translation; and to these again a yet more recent publication by Ercolani, on the anatomical type of the placenta in mammals and the human species. The volume is like a series of concretions each fixed to the other, and arranged chronologically. The latest essay—since it expresses Ercolani's latest opinions—is of particular value. After the reader has become acquainted with the general outline of the subject we would suggest that he read the volume as a Hebrew manuscript from right to left, at least so far as the subjects are concerned. When he has mastered the exposition of the subject in the *last* essay he may read the preceding ones.

It would be a curious and instructive study to follow our author through his discriminating and never ungenerous comments upon the labours of the writers preceding him. But for this by no means least valuable portion of the volume, we must refer the reader to the text itself. It is a pleasant comment to make upon the spirit in which anatomists have laboured at the difficult subject of the structure of the placenta that nowhere in the book does an acrimonious expression occur. On the contrary, such phrases as the following are not infrequent: "fortunately at this period the distinguished anatomist, Professor William Turner, of Edinburgh, devoted himself with a rare steadiness of purpose to this kind of investigation, and had the happy opportunity of bestowing his learned and conscientious researches upon no small number of animals, either rare in themselves or difficult to obtain in a state of pregnancy." It must be remembered that Turner and Ercolani had come at one time in their studies to somewhat different con-

clusions. Again, Prof. Ercolani says of Bischoff, whose views respecting the maternal and the placental conjunction he had vigorously combated, "With a generosity rather unique than rare, valuable material for study was placed at my disposal by the distinguished professors—Bischoff and Milne Edwards."

The text is handsomely and abundantly illustrated by means of an atlas of ten quarto plates, engraved by Bettini, and reproduced by the heliotype process.

Dr. Marcy has placed the profession under obligation for the admirable manner in which he has accomplished his task. It has been very evidently a labor of love. He well writes, "By these researches is opened an almost unexplored field in the pathology of gestation, and this, too, is essentially the medical and more practical view of the subject. In the abnormal development of the placenta, and in the modifications of the nutrition of the fœtus will be found causes hitherto unknown of embryonic disease and arrest of intra-uterine life." This is the use which the profession will make of this addition to its literature. Let us glance once more at Prof. Ercolani's text for the spirit which actuated him in securing this contribution so fertile in its suggestion of "diseased action." A spirit we fear that is but little acknowledged in this age of *practical* medicine. Let the student who thinks that everything that is not practical is not worth knowing ponder over these words, coming as they do from one who has solved the problem of the structure of the placenta.

"With reverence," says our author, "do I recall the honoured memory of Filippo Ingrassia, who, in the classic land which was the cradle of the revival of letters, eulogized at the close of the sixteenth century the fruitful union of human and veterinary medical science in his famous oration, published in 1568, entitled 'Quod Medicina Veterinaria formaliter una eademque sit, cum Nobiliore Hominis Medicina.' At a period so remote from our own, and when veterinarians were only poor farriers, holding a very humble position compared with those skilled in human surgery, this was the happy intuition of a noble mind, which boldly outrun the times, sowing the seed of that entire revolution which after three centuries comparative and experimental pathology have introduced into all medical instruction. . . . Comparative pathology will make its way among those who cultivate medical science throughout the civilized world. . . . If I shall be successful [in elucidating the structure of the placenta] the merit will not belong to me, but to the university in which I was educated in medical knowledge, where my illustrious master learnedly explained the pregnant teaching left us by Ingrassia, and to my having pursued in the study of the human placenta the method adopted by Fabricius, of Acquapendente, three centuries ago."

H. A.

ART. XXIII.—*A Text-book of the Physiological Chemistry of the Animal Body, Including an Account of the Chemical Changes occurring in Disease.* By ARTHUR GAMGEE, M.D., F.R.S., Professor in Victoria University, Manchester; Brackenbury Professor of Physiology in Owen's Coll. Vol. 1. 8vo. pp. xix., 485. London; Macmillan & Co., 1880.

IN taking up a work like the present one, replete with all the attractions of the latest scientific research in its own peculiar field, the reader who can look back over a quarter of a century's experience, cannot fail to be reminded of the astonishing progress that has been made in the department of Physiological Chemistry. Indeed it may be affirmed that chem-

istry itself, as a science, has been almost metamorphosed within this period; and physiology has not been behindhand in its own important developments. It is certainly within the bounds of truth to assert that Physiological Chemistry, as a science, was unknown fifty years ago. Those are yet living who can remember being taught that the functions of the animal body, as well as the various changes in its solids and fluids, are due exclusively to, what was then vaguely termed, *the vital force*; the idea of chemistry or physics being at all concerned was hardly dreamed of. How different is the experience of the student of the present day! Now, the very foundation of physiological knowledge is laid, so to speak, in chemical facts and doctrines; and these, moreover, must be diligently worked out by him in the laboratory, or received as the results of the investigations of others.

The author of the present treatise needs no introduction to the American reader. He has been long recognized as an authority in this, as well as in other departments of medical science. We have now before us, as the result of his careful and laborious researches, the first volume of "The Physiological Chemistry of the Animal Body;" "comprising the chemical composition of, and the chemical processes relating to, the elementary tissues of the body; including the blood, lymph, and chyle." The chemistry of the "Animal Functions" is reserved for the second volume, which the author promises to give us within a year.

We will briefly lay before the reader a summary of Volume I., premising that the author does not by any means confine himself to a mere chemical history of the elementary solids and fluids of the body; but he very wisely, we think, prefaces this with a brief description of their anatomical and physiological properties, by which he secures the interest of his readers in what might otherwise prove only a dry and uninteresting detail.

He commences, as is customary, with the chemistry of the proteids, albumin, fibrin, casein, the peptones, etc.; first giving their general characters, their origin, physiological relations, and their transformations or metabolism. Their method of separation from other bodies with which they may be associated, by the process of dialysis, as likewise the mode of their examination by polarized light, is described and accurately figured.

The metabolism of the proteids has afforded a wide and tempting field for speculative research, especially to the transcendental German mind. When we recall the prodigious number of the products of their decomposition through the agency of water, heat, putrefaction, the action of the strong mineral acids and alkalies—such as leucine, tyrosine, butyric, valeric and caproic acids, lactic acid, aspartic and glutamic acids, benzine, aniline, phenol, etc. etc.—we might expect that theories would not be wanting to explain and illustrate the exact manner in which these various transformations occur. Of course, in the metabolism of such complex bodies, where merely the addition or subtraction of an atom or two of oxygen, or even the simple alteration in the arrangement of the molecules, will result in the production of a new body,—just as a new form results from every turn of the kaleidoscope,—almost any theory may appear to be plausible, although it may be far from being the correct one. Fortunately for science, the theory is comparatively of little value, provided the facts be proven.

As regards the multiform products of the decomposition of the proteids, we are forced to agree with the author, that "although the progress of organic chemistry has been great, and our knowledge of the constitution of

bodies has been wonderfully increased, we are yet far from being able to unravel the constitution of such complex bodies as the proteids." We know that in the animal body the ultimate results of their oxidation are urea, carbonic acid and water, but what exactly are the intermediate metamorphoses—the results of the various chemical twistings and turnings—we can only partially make out. It is, however, certain that in these intermediate changes, substances destitute of nitrogen, such as the carbohydrates, and also fat are produced. But how limited are the resources of the chemist of the present day, with all his boasted knowledge in his attempt to imitate any of these processes which are incessantly occurring in the animal economy! As the author truly observes, "no one has given valid proof of having, by an artificial oxidation, obtained urea."

As might have been expected from the importance of the subject, the author devotes a considerable space to the *Blood*. The proper method of collecting blood for examination from a living animal is described in detail, and a figure of the apparatus given; and the author takes occasion to recommend his method of very completely anæsthetizing dogs for experimental purposes, by first administering, hypodermically, two grains of meconate of morphia, and after the lapse of half an hour when complete narcotism is produced, to follow with the chloroform inhalation; by which means the anæsthesia may be maintained with great ease for a considerable time. The *specific gravity* of human blood is given at 1055 (average): that of dog's blood at 1060; and that of rabbit's blood 1047 (average).

The time at which *coagulation* takes place varies in different animals, according to the author, and is in the following order, beginning with the most rapid: rabbit, sheep, dog, human, ox, horse. It commences in men within four minutes after being drawn, and is completed within twelve minutes. In women, the process is more rapid, by one to three minutes. The circumstances which retard and accelerate coagulation, and the methods of procuring pure liquor sanguinis or plasma are carefully described; as is also Ranier's mode of procedure for exhibiting the formation of fibrin in blood under the microscope.

The *theories of the coagulation of the blood* are given in considerable detail, the researches of A. Schmidt and Hammarsten being particularly dwelt upon, as affording the latest results of experimental investigation. According to these authorities, there exist in the blood at least two proteid bodies named respectively *fibrinogen* and *paraglobulin* (serum-globulin or fibro-plastic substance). These bodies are probably the precursors of fibrin in the process of coagulation. The old doctrine that the cause of the coagulation of blood is owing to an inherent property in the fibrin to coagulate has been materially modified by modern observers. In 1831, Dr. Buchanan, of Glasgow, discovered that the addition of washed blood-clot to the serous fluid of the pericardium, the pleura, or of a hydrocele would produce a coagulum similar to that which separated spontaneously from blood. He believed that fibrin was not disposed to coagulate spontaneously, but only when under the influence of the washed blood-clot,—very much as milk is coagulated by rennet. Moreover, he found that the particular active element of the blood-clot was the colourless corpuscles. The researches of A. Schmidt, of Dorpat, at a still later period, advanced our knowledge considerably farther. This investigator was enabled to isolate the two proteid bodies, fibrinogen and paraglobulin, both of which are fibrin generators, but (as his later researches showed) dependent for their action upon the presence of a third body—a ferment, under whose

specific influence the other two bodies reacted to produce fibrin. An analogy will immediately be suggested to the chemist in the case of amygdalin and emulsin, in the bitter almond, reacting with water to evolve hydrocyanic acid and the oil of bitter almonds. This fibrin ferment of Schmidt appears to be intrinsically connected with the colourless corpuscles of the blood.

The author details the methods of preparing these three interesting substances from blood, and describes their respective properties—physical and chemical. The important physiological question—why the blood does not coagulate in the living body—he answers somewhat vaguely, we think, by saying that it “is probably connected with a persistence in an intact condition of the colourless cells, or rather of those cells in which the fibrin ferment originates, and not as might have been supposed, upon the destruction of the fibrin ferment by the vascular walls at the moment of its liberation.” As the conclusion of the whole matter, although much interesting light has been shed upon the *manner* in which the coagulation of blood takes place, we are forced to admit that nothing has been shown to disprove the doctrine of the spontaneous coagulation of fibrin, *when once that substance is actually formed*.

The two important proteids of the serum are *serum globulin* (paraglobulin) and *serum albumin*. The former of these has already been alluded to. According to Hammersten, the relative proportion of these two ingredients of serum varies remarkably in different animals, man included. In the horse (in 100 parts of serum) the serum globulin amounts to 4.565; the serum albumin to 2.677, the proportions being 1 to 0.591. In the ox, the proportion is 1 to 0.842. In man the proportion is 1 to 1.511 (3.103 of serum globulin to 4.516 of serum albumin). In the rabbit, the proportion is 1 to 2.5.

The various methods of obtaining pure serum albumin, together with its chemical reactions, are accurately described. The conclusion is also arrived at that the peptones, which are found so abundantly in the alimentary canal as the results of digestion, “cannot be demonstrated as such even in the blood of the portal vein, taken whilst absorption is progressing.”

The *extractive matters* of the plasma and serum include a number of substances which are extracted by means of the different menstrua, alcohol especially. These bodies, although they exist in comparatively small quantities in the blood, yet play a most important part in the physiology of the living organism. They include fats, sugar, urea and uric acid, creatin and creatinin, cholesterin, etc. The description of these substances the author very properly reserves for Volume II., when he comes to treat of the various functions of the body, in connection with which they would naturally be formed,—*e. g.*, fats under the head of digestion; sugar under that of the liver; urea and uric acid under that of the kidney; creatin and creatinin in connection with muscle, and so on.

As regards the *salts* of the plasma and serum, the only points of special interest to notice are: 1. The serum contains a somewhat smaller proportion of inorganic salts than the liquor sanguinis, some being carried down with the fibrin when it separates. 2. The amount of inorganic matter left by cautious incineration is from 0.7 to 0.9 per cent. 3. The ash consists of (*a*) sodium chloride, the principal ingredient (61 to 65.2 per cent.); (*b*) sodium carbonate (about 29 per cent.); (*c*) potassium chloride (about 4 per cent.); (*d*) still smaller quantities of phosphates of sodium, magnesium, and calcium, together with potassium sulphate. But the precise

mode in which the phosphoric acid exists in the liquids seems to be yet an open question. The experiments of Pribram and Gerlach go to show that "serum contains a much smaller quantity of phosphoric acid than is present in its ash; and that the greater part of the phosphoric acid in the latter is derived from an organic compound soluble in alcohol."

The sections on the *blood corpuscles* are replete with interesting information, both physiological and chemical. They include the consideration of their structure, size, the proper mode of their microscopic observation and enumeration, and the methods of their chemical analysis. The name at present given to the true blood-colouring matter is *oxy-hæmoglobin*, in place of the old term *hæmatin*; the latter is now known to be merely a product of the decomposition of the former.

Oxy-hæmoglobin constitutes the bulk of the red blood-corpuscles; it may be procured directly from the latter or from the blood clot, in the crystalline form. It is obtained much more readily from the blood of certain animals than from others—that of the rat yielding the crystals with greatest facility. Quite a number of manipulations are given by the author, which need not be detailed here. The empirical formula for oxy-hæmoglobin, as given by Preyer, and deduced from analyses of Hoppe-Seyler and C. Schmidt, is $C_{60}H_{960}N_{154}FeS_3O_{173}$.

The following is a brief summary of its more important physical and chemical properties: As obtained from the blood of man and of the majority of the lower animals, oxy-hæmoglobin crystallizes in prisms or rhombic plates of a fine red colour. That of the squirrel crystallizes in hexagonal plates; that of the guinea-pig in tetrahedral crystals. It differs much in solubility in water, as obtained from different animals; that of the bullock and pig is very soluble, whilst that procured from the guinea-pig is much less so. It is very soluble in weak alkaline solutions; an excess of alkali soon induces decomposition. Acids and salts decompose it, with the formation of hæmatin. It is precipitated by alcohol with decomposition, but by potassium carbonate, at a low temperature, without decomposition.

It is, however, in the optical properties of oxy-hæmoglobin, as exhibited by the spectroscope, that medical and medico-legal interest chiefly centres. The simple fact that the spectroscopic examination of blood will exhibit certain well-marked absorption bands in the spectrum has been known since 1864. The researches of Mr. Sorby and Prof. Stokes especially have made us familiar with this method of detecting the presence of minute quantities of blood; so that the spectroscope has now become a most valuable corroborative test for blood stains in criminal trials. Stokes discovered that when diluted blood was treated with certain reducing agents, the colour of the liquid was changed from a red to a brown, and the spectrum was also altered so as to present a single broad absorption band instead of the double band, which had previously been produced in the green space by the unchanged oxy-hæmoglobin. This constitutes the spectrum of *reduced hæmoglobin*. From these experiments Stokes concluded that the colouring matter of blood may exist in two conditions of oxidation, distinguishable by the action of the spectrum, and that it may be made to pass from the more to the less oxidized state by reducing agents, and recover its oxygen again by absorption from the atmosphere. This, then, is the fundamental idea in relation to the spectrum-analysis of blood—the effect produced by deoxidation and by subsequent oxidation. Different methods of reducing oxy-hæmoglobin to hæmoglobin are described by the author, which space will not permit us to give here.

The interesting chemical fact is alluded to that "where diluted blood is dropped upon a filter-paper, which has been moistened with tincture of guaiacum and then dried spontaneously with air, a blue ring forms at the edge of the drop." "This reaction is not produced by all specimens of tincture of guaiacum. The bluing of the resin of guaiacum is due to its oxidation, and is also observed when ozone acts upon it, but not when common oxygen does so." When the oxy-hæmoglobin is deoxidized it no longer possesses the power of bluing guaiacum, but if brought into contact with atmospheric oxygen, it immediately recovers it.

Now, just here, it is important for the medico-legal student especially, to understand the precise value of the so-called *guaiacum test* for blood. According to Dr. Day, of Australia, and verified by the late Prof. Taylor, of London, the red colouring matter of blood, never *immediately* changes the colour of the tincture of guaiacum, unless in the presence of peroxide of hydrogen (antozone). No value is to be placed on any change of colour which requires any considerable length of time for its production. It is true that the guaiacum may become blue-coloured after *long* exposure to the air by oxidation; but when a fragment of blood, however small or however old, is brought into contact with fresh tincture of guaiacum, together with the ethereal solution of peroxide of hydrogen (ozonized ether), the characteristic blue colour is *immediately* struck. Furthermore, no other red colouring matter has been found to produce this bluing of guaiacum in the presence of peroxide hydrogen. The very essence of the test, so to speak, consists in the *rapid* appearance of the blue colour, under the combined influence of the two above-mentioned reagents upon the blood stain.

It is now admitted by physiologists that the *iron* of the blood exists exclusively in the oxy-hæmoglobin of the red corpuscles. According to Preyer, 100 grammes of blood contain the following properties of iron in the corresponding amount of colouring matter, in a healthy man:—

	Hæmoglobin.	Iron.
Minimum	12.09 grms.	0.0508 grm.
Maximum	15.07 "	0.063 "
Average in 11 cases	13.45 "	0.056 "

In a healthy woman:—

	Hæmoglobin.	Iron.
Minimum	11.57 grms.	0.048 grm.
Maximum	13.69 "	0.057 "

One hundred parts of dry crystallized oxy-hæmoglobin contains 0.42 parts of iron (Preyer).

Among the products of the decomposition of oxy-hæmoglobin, particularly by the agency of acids and acid salts, the most interesting are *hæmatin* and an intermediate body termed *methæmoglobin*. We can only offer a few remarks in connection with hæmatin. This substance may be obtained by the action of acetic acid on blood, and then shaking it with ether, which dissolves out the colouring matter. It can only be procured pure from crystallized hydrochlorate of hæmatin (hæmin). As thus prepared, it has a blue-black colour and metallic lustre; it is insoluble in water, alcohol, and ether; easily soluble in dilute alkaline solutions; insoluble in dilute acids. It contains, according to Hoppe-Seyler, 8.82 per cent. of iron. This large percentage of iron is to be explained from the circumstance that the whole of the iron belonging to oxy-hæmoglobin is in reality attached to the hæmatin, which is only one of the constituents of

the former. It may be heated to 180° C. without decomposition; at a higher temperature it burns, evolving hydrocyanic acid, and leaving an ash which consists of 12.6 per cent. of pure oxide of iron. The empirical formula for hæmatin is: $C_{68}H_{70}N_8Fe_2O_{10}$. As before mentioned, when the oxy-hæmoglobin of the blood has by long exposure to the air, or otherwise, been transformed into hæmatin, the characteristic change is produced in the absorption bands of the spectrum.

If a drop or two of blood be boiled with glacial acetic acid, the colour changes to brown, and on evaporation, prismatic crystals are yielded of a dark brown colour. They are sometimes in the form of rhombic plates, arranged in radiating bundles; they constitute what have been usually termed "blood crystals." Such crystals may be obtained from any blood stain on clothes by cutting out the stained tissue and heating it with glacial acetic acid, taking care to add a small crystal of sodium chloride. The evaporated residue contains the crystals. There is some difference of opinion as to the precise composition of hæmatin. Thudichum says that it contains no chlorine: he regards hæmin to be nothing more than crystallized hæmatin. Hoppe-Seyler asserts that he never obtained hæmin crystals that were free from chlorine, which agrees with the original statements of Teichmann on their composition.

Passing over the sections on the *white blood-corpuscles*, and the various coloured corpuscles of certain invertebrata, we come to the chapter on "The Changes which the Blood undergoes in Disease," a subject which has always afforded a most interesting field for physiological and pathological research. There is abundant proof of the fact that considerable variation may occur in the proportion of some of the principal constituents of the blood within the bounds of health; and also that the loss of blood by hemorrhage will rapidly influence the composition of that which remains in the system. The variation in the quantity of the water is the most marked change.

There is nothing especially new in the enumeration of the various alterations of the blood in connection with different diseases. The author gives us the results of the recent investigations of the most trustworthy experimenters. The amount of hæmoglobin in health is proportional to the number of corpuscles. This is not, however, the case in disease (anæmia). As regards the fibrin, while, of course, admitting its well-known increase in inflammations—even up to 10 parts in 1000 of blood—the author is disposed to attribute their increase to "the proliferation of cellular elements which accompanies the process of inflammation, which will add to the number of colourless cells of the blood, and to the amount of serum-globulin which will be available in the process of coagulation."

The *serum-albumin* (av. 80 in 1000) increases in cholera, and after the use of hydragogue cathartics (C. Schmidt). It diminishes notably in "Bright's disease, anæmia, scurvy, dysentery, and generally in chronic disorders, which impair the general nutrition." The *sugar*, of course, is increased in diabetes. The amount of *urea* is largely increased in Bright's disease, in cholera, and yellow fever. *Uric acid* is remarkably increased in gout, but not in rheumatism. One or two diseases require a separate passing notice in this connection. In *anæmia*, it might have been supposed that the amount of loss of the hæmoglobin would correspond with the loss of the red corpuscles; but this is shown not to be the case, for the reason that the composition of the corpuscles is liable to vary in disease, as was first demonstrated by Schmidt in the case of cholera; more

recently by Hayem and Malassez, who have shown "that in the various forms of anæmia the anatomical characters of the red corpuscles are affected." As a summary of the results of these recent investigations, we may say that these variations affect the *size, number, form, and coloration* of the corpuscles. Thus, according to Hayem, three different sizes of red corpuscles may be observed in healthy blood, which he classifies as *large, medium, and small*, the large constituting about 12 parts in the 100, the medium about 75 parts, and the smaller about 12 parts. In anæmia the blood contains a *large excess of small corpuscles*, and this diminution of size refers not only to their diameter, but to their whole volume. Thus, in very pronounced cases of anæmia, in consequence of this decrease in their size, 100 corpuscles may correspond to only 80, or even 65 healthy ones. Again, in anæmia, although there is a marked diminution in the *number* of the red corpuscles, this is not invariably the case. The *form* of the corpuscles also undergoes a change in anæmia, "seemingly dependent upon a diminished consistence, and which chiefly affects the medium or small corpuscles, which often assume an elongated oval form." But the most important change in anæmic blood is connected with its *colour*, the pale tint resulting from a most notable loss of hæmoglobin. In the most intense cases of this disorder, the decrease of hæmoglobin has been known to reach the enormous amount of seven-eighths of the normal quantity. In moderate cases, the loss may amount to one-half to three-fourths. The above results throw considerable light on the true pathology of anæmia. The remarkable effects of iron in restoring the lost colouring matter of the blood, so well known, are amply confirmed by the author's tabular statements.

In *leucocythæmia* (leukæmia) there is an enormous increase of the white corpuscles, so that their number "may amount to one-sixth, or, it is said, even one-third the number of the coloured corpuscles. Usually, the colourless corpuscles do not differ in shape and size from those in normal blood, though in certain cases they appear to be smaller in size."

Gout affords a notable example of a disease in which a change in the blood composition plays a conspicuous part. In 1848 Garrod discovered that during the course of gout, the blood invariably contains an excess of *uric acid*. This accumulation is probably owing to its non-elimination by the kidneys, seeing that "whilst the attack of gout is at its height, though the relative proportion of uric acid in the urine may be high, and an actual spontaneous separation of it often occurs after emission, the actual amount excreted is usually below the normal." This retention of uric acid in the blood is doubtless connected with the kidney affection, which almost always accompanies gout. Moreover, in gout the blood, according to Garrod, contains oxalic acid, and probably also an excess of urea.

The chief chemical and pathological distinction between gout and *rheumatism*, according to the author, is that in the latter disorder there is no excess of uric acid in the blood, and in the majority of cases, likewise an absence of lesions of the kidney. The most marked change consists in a considerable increase in fibrin.

In subacute rheumatism, and in so-called rheumatic gout (rheumatoid arthritis), "there are no constant changes in the composition of the blood." A most important difference between it and true gout being that in the former disease there is "no tendency to the accumulation of uric acid in the blood, and to its subsequent deposition in the tissues of the body."

Of the chemical changes produced in the blood by *fevers* very little

need be now said. The author gives us all the latest facts, which vary but little from what is already known. He remarks that "though there can hardly be any doubt that all zymotic diseases are produced by certain germs or elementary organisms, yet there are only two diseases in which the presence of such germs in the blood has been clearly demonstrated, in relapsing fever and splenic fever (of cattle)." Several figures of the "spirillum" of relapsing fever are given, showing these organisms to consist of slender spiral filaments. They exist in the blood of the patients, but not in their organs after death. "They are found in the blood only during the paroxysmal attack; they are absent in the interval, and reappear several hours after the second attack has set in." By inoculation, they are capable of imparting the disease to a healthy person.

The natural history of the *splenic fever of cattle* is interesting, but space will only permit us to remark that in the blood of the animal the bacterium termed *Bacillus anthracis* has been found; to which the propagation of the disease is owing.

In this connection it is only proper to remark that in certain contagious and infectious diseases, the presence of germs in the blood has been remarked; as bacteria and micrococci in the blood of pyæmia, septicæmia, scarlatina, and diphtheria. Likewise certain parasitic organisms have been detected in the blood in some diseases endemic in Egypt and India; in which also the ova and embryos have been recognized in the urine.

In malarial fevers there appears to be no notable chemical alteration of the blood, until, in the advance of the disease, anæmia sets in. The author alludes to the recent discovery of Klebs and Tommasi Crudeli of a bacillus growing in the soil of malarial districts, to which they have given the name of *B. malaria*, "which when introduced into the system of rabbits induces fever of an intermittent type." No mention however is made of the experimental researches of our own countryman, Dr. Salisbury, who, many years ago, published the results of his investigations upon this subject in this Journal. It is also stated that about a year ago "Marchiafava has, in three fatal cases of pernicious malarial fever, succeeded in discovering in the splenic pulp in the blood, and in the marrow of the bones, spores and filaments of *B. malaria*."

In *scarlatina*, *measles*, *smallpox*, and *erysipelas*, there are no characteristic chemical alterations of the blood. In *cholera*, as we all know, the blood has been carefully examined, and the results noted. The reader need only be reminded of its extreme viscosity, owing to the osmotic transudation of the watery portions into the intestines. There is also a considerable increase of *urea* in the blood of cholera, with a loss of its saline constituents.

Only one other disease can now be alluded to, viz., *Bright's disease of the kidney*. As is well known, the most important chemical changes in the blood, in this affection, consist in the diminution of the albumin and the increase of the urea. As regards the convulsions and coma which are usually considered as being occasioned by the action of the urea upon the great nerve centres, the author does not deem this explanation as sufficient: "The condition of uræmia is one which depends on many factors. Before the condition of uræmia is induced, the blood has usually become rich in water, poor in albumin, poor in corpuscles; and that in addition to an accumulation of urea and uric acid, it probably contains an excess of other proximate principles which may exert a specially poisonous action."

Passing by the chapter which contains a detailed description of the most

approved methods of separating the different constituents of blood in health and diseases, together with figures of the apparatus required (some of which are sufficiently complicated), we come to Chapter V., which treats of "Lymph and Chyle, together with transudations normal and pathological." After describing the difference between chyle and lymph, and postponing the consideration of the former to Volume II., the author gives us the method of procuring fresh lymph from an animal, and then proceeds to describe its physical and chemical properties. Admitting the identity of the lymph-corpuscles and the white blood-corpuscles, he agrees with most modern authorities in ascribing their origin chiefly, though not exclusively, to the lymphatic glands; since "wherever lymphoid or adenoid connective tissue exists, as for instance in the mucous membrane of the stomach, and in the follicles of the thymus, of the tonsils, and of the spleen, there is doubtless a formation of lymph-cells."

The proteids of lymph are essentially the same as those of blood, although the proportions of some of these are very different; thus the fibrin of lymph exists in the proportion of 0.4 to 0.8 parts in 1000; the amount of serum-albumin varies between 21 and 60 parts in 1000. Sugar and urea are found in about the same quantities as in blood. Lactic acid, leucine and tyrosine have also been discovered. The salts are similar to those of the blood. The gases consist of carbonic acid, nitrogen, and a trace of oxygen.

The *liquids found in healthy serous sacs*, as the pericardium, peritoneum, and thorax, resemble true lymph in every respect. There is an exception however in the case of the *synovia*, which contains a larger proportion of solids than is found in the fluid of serous sacs, and is "specially distinguished from them by containing *mucin*."

The effused *liquids of dropsies* are not always identical in chemical composition, but vary in different situations even of the same body, "in consequence of local peculiarities." This difference in composition is illustrated by several analyses, given by the author, of the fluids taken from the pleura, peritoneum, sub-arachoid and that of œdema of the feet, —the solid matters varying from 11.30 (œdema) to 36.05 parts (pleura) in 1000 in one case; and in another from 17.83 (œdema) to 42.41 parts (pleura). The variation of the albumin is even yet greater. Dropsical fluids sometimes contain fibrin (as when they transude into an inflamed membrane); in other cases they contain only fibrinogen. They always coagulate, either spontaneously, or by aid of heat. They also contain both serum-albumin and serum-globulin; and the salines and extractives (urea and sugar) are found in about the same proportions as in the liquor sanguinis. The gases are carbonic acid, nitrogen and oxygen; though the latter is sometimes absent.

Chapter VI. is devoted to the physiology and chemistry of *pus*, and appears to have been very carefully worked up. The pus-globules "when first formed, resemble, if they are not identical with, the colourless cells of the blood;" when older, however, they present a more granular appearance, and exhibit several distinct nuclei. Pus-serum (liquor puris) resembles much the liquor sanguinis and the normal transudations; "it is doubtless, in great part, a transudation from the blood." It contains substantially the same proteids as the blood-serum, viz., serum-albumin and serum-globulin: the same is generally true also of the salines and extractives.

In the *cell-protoplasm of pus* three distinct proteids soluble in water exist, according to Miescher, which possess distinct chemical reactions.

Besides these, two others insoluble in water are present, one of which was formerly supposed to be identical with myosin. The *nuclei* of the pus-cell yield a peculiar insoluble body containing phosphorus to which Miescher has given the name of *nuclein*; the author, however, is somewhat doubtful of its existence as a definite body. The pus-cells contain an appreciable amount of *glycogen*; their chief *extractives* are cholesterin, fats and derivatives of glycerin-phosphoric acid. Their mineral constituents are principally sodium chloride and earthy phosphates. An interesting fact in relation to the blue colouring-matter which is occasionally formed in pus, and to which Fordos gave the name of *pyocyamin*, is that it has lately been shown by Fitz to be usually due to a species of bacterium, of the form of a *bacillus*.

In Chapter VII. we have an account of "The Connective Tissues." These include *connective tissue cells*, *white fibres of connective tissue* (tendons), *elastic fibres of connective tissue* (ligaments), and *ground substance of connective tissue*. With the histology of these structures we are not now specially concerned. The reader may perhaps be reminded that the white connective tissue, represented by *tendons*, yields the peculiar substance termed *collagen* (formerly collin), the characteristic of which is that it is converted into *gelatin* by the action of boiling water. The closely allied body *chondrin* is procured from cartilage, by long boiling in water under pressure. Both these substances are insoluble in cold water, alcohol, and ether. Both are soluble in boiling water, and their solutions, on cooling, *gelatinize* in a precisely similar manner. Their chemical differences are the following: Tannic acid precipitates gelatin even in very dilute solutions; its action on chondrin is much less marked. Gelatin is not precipitated by acetic acid, which throws down chondrin, the precipitate being soluble in an excess of the reagent. Chondrin is also precipitated by alum, acetate of lead, nitrate of silver, and sulphate of copper—which do not affect gelatin.

The *ground-substance or matrix* of the connective tissues is common to all the foregoing varieties of this tissue; it appears to be identical with the substance named *mucin*, which is the chief constituent of mucus, and is found also in epidermis, where it connects together the epithelial cells. It likewise constitutes a large portion of embryonic connective tissue. Mucin is a ropy, gelatinous substance, held in suspension by water, and soluble in very dilute hydrochloric acid. It is not affected by tannic acid, but is precipitated by lead acetate, though not by other mineral salts.

Certain late investigations render it probable that all the connective tissues possess common chemical properties; also, that chondrin is only a mixture of gelatin, mucin, and salts.

Under the head of "Osseous Tissues," a good description is given of the chemical composition of the bones of man and the various lower animals; and very full tables of their comparative analysis are added. As regards the chemical changes in diseased bones, a remark may be made on *rickets*. The author takes occasion, very properly we think, to criticize a modern theory which ascribes the production of this disorder mainly to the formation of lactic acid in the alimentary canal, and its subsequent absorption into the blood, and its then acting as a solvent on the calcareous salts. There is no established proof of this action of lactic acid, nor can it be supposed that the blood could possibly lose its normal alkalinity, as would obviously be the case if a *free* acid were present. Very full details are given for procuring the different constituents of bone, and determining their proportionate amounts.

We pass over Chapter VIII., which treats of the "Epithelial Tissues," as presenting nothing especially new, and therefore not requiring any present notice; and find in Chapter IX. an interesting account of the "Contractile Tissues," under which head the author discusses the structure and properties of the *striated and non-striated muscular fibres*. The anatomical and physiological, as well as the chemical description of these structures, is very complete and satisfactory.

The following bodies, among others, have been procured from living muscle, and their properties established: *Sarcolemma*, the delicate investment of muscle-fibre, is very analogous, in composition and properties, to elastic tissue. The *double-refracting (anisotropous) matter* of voluntary muscle is solid both during life and after death; it is probably a proteid derivative. The *muscle-plasma* is the isotropous liquid of voluntary muscle-fibre. It can only be obtained from perfectly fresh muscle before rigor mortis has set in. The muscle must be frozen, and then subjected to strong pressure, at a low temperature. It is in the form of a viscid liquid, which at ordinary temperatures coagulates spontaneously, precisely like liquor sanguinis. The solid body resulting from this coagulation is named *myosin*. It does not separate from blood-plasma in a very cold temperature. "It differs from fibrin in being a gelatinous mass from the first; it never becomes fibrous, nor has the opacity of blood fibrin."

The nitrogenous (non-proteid) bodies are *creatine*, *creatinine*, *xanthine*, *hypoxanthine* or *sarcine*, *inosinic acid*, and *taurin*. The non-nitrogenized matters include *fats*, *glycogen*, and *inosit*. The salts are chiefly potassium phosphate, with minute portions of sodium, calcium, and magnesium phosphates, together with traces of chlorine and iron.

The most interesting and important phenomenon of muscular life is its *contractility*, including the *rigor mortis*. "The whole phenomenon of contraction comprises (1) a sudden acceleration and extension of chemical decomposition; and (2), a sudden and extensive conversion of the potential energy of chemical affinity into actual energy of various forms." These forms are those of heat, electrical disturbance, and mechanical motion. The visible *manner* in which the muscle-fibres contract, as seen under the microscope, need not be referred to here, as it is fully explained in all modern works on physiology. Neither may we be tempted to dilate upon the important relationship between the energy of muscular contraction and the amounts of heat, electricity, and mechanical power evolved.

The necessity for a due supply of oxygen to enable muscles to contract is shown by numerous experiments—directly, by the fact that an exhausted muscle can be made to recover its power by injecting into it arterialized blood, and *indirectly*, by the circumstance that the amount of carbonic acid excreted during muscular contraction very closely corresponds with the quantity of oxygen respired, and the amount of energy displayed.

As is well known, the *rigor mortis* is the last act of muscular life; after cadaveric rigor passes off, putrefaction immediately commences. Although, undoubtedly, closely allied to muscular contraction, it yet differs from it in certain particulars. "Rigid muscle is less extensile, as well as less elastic, than normal resting muscle, thus differing from contracted muscle, which is more extensile. It is further distinguished from contracted muscle by its peculiar doughiness and opacity." The author attempts no explanation of the cause of rigor mortis, other than that to which it is usual now to attribute it—the coagulation of the myosin. The evolution of heat which accompanies rigor mortis, together with the forma-

tion of lactic acid, and the elimination of carbonic acid, are circumstances which clearly demonstrate the analogy between ordinary muscular contraction and cadaveric rigidity. The evolution of heat just alluded to as accompanying the rigor mortis, termed *post-mortem calorificity*, may frequently escape observation; but under certain conditions, as after death from cholera, yellow fever, and other diseases, the temperature of the body has been known to rise nine to ten degrees beyond that existing during life.

The author devotes considerable space to describing the various chemical changes that result in the contraction of muscles, together with the proper methods of experimentation. One only will we here allude to, namely, the formation of *lactic acid*, which the latest investigations show not to pre-exist in living muscle (as was formerly supposed), but always in *dead* muscle, however fresh. Its amount, moreover, always increases in a tetanized (contracted) muscle in proportion to the resistance overcome; the same is also true in rigor mortis.

Finally, on this subject, we may very briefly allude to the excretion of urea by the kidneys as an index of muscular metamorphosis. Until very recently physiologists have believed that the amount of urea excreted by the kidney represented, with tolerable accuracy, the amount of nitrogenous disintegration caused by muscular action. A different view is now held by the latest experimenters. According to our author, "the urine, so far as it represents the tissue-waste of muscles, is dependent upon the nutritional rather than upon the functional processes of muscular tissue." While admitting, then, that muscular exercise does increase excretion of nitrogen products, we are not to forget that the nature of the food is an important factor in the result. Indeed, it would seem that very frequently the immediate effect of exercise is to diminish rather than to increase the quantity of urea, so that, in the opinion of Parkes, its elimination is greater during rest than during labour. Upon this interesting subject a great deal might profitably be said, if the limits of this article, already exceeded, permitted.

We must pass on to consider, very briefly, Chapter X., which contains a description of the "Nervous Tissues." With the histological elements of the nervous system we are not now concerned. As to their chemical composition we may observe that "more than one-half of the solids contained in the gray matter, and about one-fourth of the solids of the white matter of the nerve-centres, consist of proteid substances."

By treating gray nerve matter, and also the medullated nerve fibres, with boiling alcohol and ether, a basement substance is obtained, very refractory to chemical agents, named *neuro-keratin*, from its analogy with the keratin of the horny tissues. It contains 2.93 per cent. of sulphur.

The *phosphorized bodies* constitute the most important and interesting compounds of nerve substance. These were formerly grouped together under the name of *cerebrin* and *cerebric acid*; but the researches of Liebreich, in 1865, resulted in isolating a definite crystalline body, to which he gave the name of *protagon*.

The author, in repeating the experiments of Liebreich, feels convinced of the real existence of this body, to which he assigns the empirical formula of $C_{160}H_{308}N_6PO_{35}$. He regards it as the best characterized of all the phosphorized compounds yet obtained. Protagon undergoes various chemical transformations, through the agency of the acids and alkalies.

Another phosphorized compound found in nervous tissue, and also in the yolk of eggs, is *lecithin*, a yellowish-white, wax-like body, whose em-

pirical formula is $C_{44}H_{90}NPO_5 + H_2O$. This substance, by decomposition, yields *glycerin-phosphoric acid*. The compound termed *neurine* (a term formerly employed to designate what was supposed to be the special material of nerve matter) is now procured as a distinct body, by the decomposition of protagon. It is a syrupy substance, alkaline in its reaction, soluble in alcohol and ether. It contains no phosphorus.

The non-phosphorized group also comprises *cerebrin*, a nitrogenized body, whose composition is not yet absolutely established; also the non-nitrogenized compound *cholesterin*, which exists in considerable amount in nervous tissues, especially in the white substance. The extractives of the brain consist of the same bodies as are found in muscle, viz., creatine, xanthine, hypoxanthine, inosit, and lactic acid, "with leucine, uric acid, and probably urea." As is well known, the proportion of *water* in the brain varies according to age, being much greater in infancy; it also differs in the white and gray matter, being considerably larger in the latter.

The importance of a full supply of oxygen to the cells of the gray matter, to enable the nerve-centres to maintain their functional activity, is witnessed by the effect produced upon the respiratory centre in the medulla, by the circulation of blood deficient in oxygen. The same is true of the mental operations; the moment the supply of oxygenated blood is cut off from the brain by compression of the large arteries, as in strangulation, all mental acts cease. It is well known that unconsciousness supervenes, in hanging and strangling, some time before life ceases.

In connection with the nervous tissues, the author discusses the "chemical history of the peripheral terminations of the nervous system, particularly those of the eye." Although this is a subject of profound interest to the student, and one offering a very tempting field for discussion, we are now compelled, reluctantly, to pass it over.

From our careful, though at times necessarily cursory, analysis of Dr. Gamgee's new work, our readers will readily conclude that we have a high appreciation of it. It is written in a very pleasing, unpretentious style, which we deem a great merit in a scientific book. It may be considered as the most reliable modern authority in Physiological Chemistry. We shall hail with much pleasure the advent of the second volume.

J. J. R.

ART. XXIV.—*Health Reports.*

1. *First Annual Report of the State Board of Health, Lunacy, and Charity of Massachusetts*, 1879. *Supplement containing Report and Papers on Public Health.* 8vo. pp. 277. Boston, 1880.
2. *Circular No. 3, of the Board of Health of the State of Alabama.* 8vo. pp. 206. Montgomery, May 1, 1880.
3. *Report on Yellow Fever in the U. S. S. Plymouth in 1878-9.* Prepared under the direction of PHILIP S. WALES, Surgeon-General U. S. Navy. 8vo. pp. 85. Washington, 1880.

1. THE successor to the valuable series of Reports of the Health Board of Massachusetts fully sustains their wide-spread reputation, and contributes numerous important facts and deductions to the general fund of knowledge held in common by sanitary scientists. Several contributions, such as that of the Secretary "On the Westfield River Basin," the admirable paper

of Prof. Edward S. Wood, of Harvard, upon the "Water Supply of Cambridge," and the excellent "Observations on Fresh Pond" and on "Mystic Water," by Prof. Wm. Ripley Nichols, whilst extremely useful to the inhabitants of these localities, possess chiefly a local interest, except as they furnish examples of the thorough investigation into the condition of the water supplies, sewerage, drainage, etc., which should be promptly instituted by every community for its own protection and advantage.

The second article in this volume, *Trichina in Relation to the Public Health*, by T. S. BILLINGS, M.V. (Royal Vet. Inst. Berlin) of Roxbury, contains one of the clearest and most comprehensive accounts of this parasite with which we are acquainted. During Mr. Billings's observations, which extended over a period of five months, in an examination of those portions of the body most liable to be infected, *i. e.*, the pillars of the diaphragm in 2701 hogs slaughtered near Boston, 154 were found to be infected, or 5.7 per cent. Investigation in regard to the rats caught in one pork packing establishment near Boston, showed that out of 40 examined no one was exempt from trichina, but in other instances the proportion was much smaller, and our author considers the theory that swine often become trichinosed by eating infected rats, as by no means proved. No successful remedy for trichiniasis is suggested, and the problem of definitely connecting calcified trichina in the human organism, with symptoms resembling those of some chronic disease such as rheumatism, remains unsolved, although we feel confident that a world-wide reputation awaits the discoverer of its solution.

Mrs. ELLEN H. RICHARDS, Instructor of Chemistry, Woman's Laboratory, Massachusetts Institute of Technology, Boston, contributes an essay on the *Adulterations of some Staple Groceries*, which displays a large amount of patient and laborious research. She found sugars were rarely adulterated, and bicarbonate of soda was of good quality in a majority of instances, but that cream of tartar was largely sophisticated with ground gypsum, and baking powders with starch.

Prof. W. G. FARLOW's paper on *Some Impurities of Drinking Water caused by Vegetable Growths* is probably the most valuable one in this volume, dealing as it does with a subject upon which there is much popular misapprehension and professional ignorance. Many curious characteristics of these low forms of vegetable life highly interesting to both microscopists and sanitarians are described, and the important practical lesson inculcated that whilst the green plants are, as a rule, quite harmless, many of the phycochromacæ or bluish-green algæ, may be highly injurious. The excessive growth of *cælosphærium* and *clathrocystis*, which are fully described and figured by our author, give rise to the so-called pig-pen odour, and soon render the affected water too offensive to drink; but how far minor degrees of development of these *Nostocs* are prejudicial to health is yet undetermined.

An excellent article on the *Drainage of Summer Hotels and Country Boarding Houses*, by ERNEST W. BOWDITCH, Engineer, of Boston, gives the results of investigations into the sanitary condition of one hundred and fifty of these "health resorts," which were found to be almost without exception unsatisfactory, and liable to become at any time breeding places for epidemics of typhoid fever, diphtheria, and other infectious diseases. We trust that the day is not far distant when every proprietor of a summer hotel or boarding house will be compelled at least by popular opinion, if not by law, to maintain his premises in such a state of perfection in regard

to drainage, sewerage, and water supply, as to receive a certificate of safety in these respects from some recognized sanitary authority, eminent enough to stand above the suspicion of fear or favour in his award, before the desired patronage of his hostlery can be obtained from an enlightened public.

2. Circular No. 3 of the Alabama Board of Health contains the Annual Report for 1879 of the Board of Censors and Committee of Public Health. The Mind and How to Preserve it, by Dr. Peter Bryce; Drainage and Under-drainage in their Sanitary and Economic Aspects, by Dr. S. D. Seelye; and the Theory and Practice of Quarantine, by Dr. Jerome Cochran. Of these papers, the first and last chiefly demand our attention.

As most of our readers are probably aware, the plan for organized sanitary effort in Alabama differs from that of other States in the Union, the rest having all adopted the general features of the Massachusetts Board of Health, which was established in 1867, and followed first by California in 1870. By this system, which it is claimed is better adapted to a sparsely settled country like that of Alabama, the State Medical Association is made the State Board of Health with a general supervision over the County Medical Societies, which are constituted the County Health Boards. Among other subjects which have occupied this important Committee of the State Society is a well-planned scheme for obtaining accurate statistics of Births, Deaths, and Diseases throughout the State, which if the cordial co-operation of the physicians practising within its borders can be secured, will do much towards accomplishing this desirable object. The grand principle of systematic effort for exclusion of contagious diseases by rigorous quarantine is asserted, in the excellent body of rules for the isolation and disinfection of persons, goods, railroad cars and passengers promulgated in regard to yellow-fever, but we regret to find the influence of the Alabama Medical Society arrayed against the extension of the powers of our National Board of Health, the services of which have been so eminent and crowned with such remarkable success that they deserve the unquestioning endorsement of every one, and above all of the people of the Gulf States. Quarantine is of necessity a troublesome, vexatious, and costly interference with freedom of travel and commerce, enforced by the *many* for their own protection, and in flagrant violation of the rights of the unfortunate few, and the most cherished *personal rights* or *State rights* should, on occasions of imminent danger from epidemics, be sacrificed willingly for the benefit of the community at large; that benefit to be most fully secured (according to the universal experience of mankind in the conduct of governments of armies, of fleets, etc.) by the action of a single, but well-advised, central executive officer. Just as the family is a type of the State, an individual is the type of the family, and we need scarcely remind such skilled physicians as the gentlemen composing this Alabama committee what distressing disturbances of the human organism ensue when during chorea the separate members of the body attempt to maintain their individual rights and assert their independence of the central organ of the will.

The concluding essay in this volume is an able and exhaustive paper upon *The Theory and Practice of Quarantine*, by Dr. Jerome Cochran, whose ardent devotion to the investigation of yellow fever during the epidemic of 1878 almost cost the profession his valued life. Under the various heads of disinfection of ships, cargoes, passengers, and crews, railroad, inter-state, intra-state, and municipal quarantines, etc., Dr. Cochran dis-

cusses the whole subject of prophylaxis against yellow fever, with the master hand of one whose life has been spent in thoughtful study of the dangers he seeks to avert from his fellow citizens.

3. The report on yellow fever in the U. S. ship Plymouth is a most timely and useful extract from the report of the Surgeon-General of the Navy, and we are glad to have official facts in regard to this remarkable case of the re-development of yellow fever poison (from some *materiæ morbi* which apparently survived the severe cold of a Boston winter), preserved in permanent and accessible form.

In his instructions to Dr. Richard C. Dean, Medical Inspector U. S. N., President of the Board having charge of the investigation, directions are given specially to ascertain "whether the second appearance of the disease in March, 1879, was due to the continued action of the original infection supposed to have been received in November, 1878," also to inquire minutely into all the circumstances "attending the exposure of the ship and her stores, clothing, coal, and other contents to a freezing temperature at the Navy Yard in Boston during the interval between the two occasions on which the disease was developed on board."

In regard to the former of these questions, it appears that after visiting St. Thomas and Santa Cruz in October, 1878, yellow fever broke out on board the ship, affecting in all seven persons. The vessel was promptly headed northward, reached Portsmouth, N. H., Nov. 30, and was "broken out" at Boston Navy Yard December 17. Nothing movable in the way of stores, provisions, and clothing was left in the ship; the crew was transferred, and the vessel fully exposed to cold. On Jan. 26, fifty pounds of sulphur were burned below decks, the temperature being below zero outside, and water freezing in every part of the ship. On Feb. 2, she was again fumigated, and on the 4th, having been whitewashed with a mixture of lime and chloride of lime, was believed to be thoroughly frozen out and purified. On the 15th of March, the Plymouth sailed for a cruise to the Windward Islands, and six and seven days later, *before approaching any land*, two cases of yellow fever occurred, one proving fatal. Hence it appears that the yellow fever poison had remained in the ship from the previous autumn, and survived the prolonged exposure to cold in a New England winter, besides the numerous fumigations which had been practised.

In regard to the second important point to be investigated, we find stated on p. 24:—

"Whether the sulphurous acid vapour penetrated to every recess of the ship is doubtful. . . . The examination of the ship already described, opened up many parts which must have been effectually protected against the freezing temperature recorded. So that if it be granted that the yellow fever poison was actually imported into the Plymouth, and that it (the poison) is endowed with the power of lying dormant under conditions unfavourable to its development without losing its potential vitality, we are of the opinion that the precautionary measures adopted in the Plymouth, energetic and well intentioned as they were, were not sufficient to insure the destruction of the cause of the disease."

The volume is enriched with a map showing the geographical habitat of yellow fever; with plans exhibiting the internal arrangement of the Plymouth, and with interesting copies of photographs depicting the rod-like (crystalline?) bodies found by the Havana Commission, to be deposited from the air of a military hospital in Havana, and of similar crystals ob-

tained in Washington, also of photographs of the fungus producing dry rot in timbers of ships, and especially abundant in the Plymouth where it was strongly suspected of preparing hiding-places for the disease germs.

Altogether the book is an admirable and successful effort to utilize for the best advantage of sanitary science, a curious *natural* experiment upon the power of yellow fever poison to renew its activity after exposure to the vaunted disinfecting agency of extreme cold for several months.

J. G. R.

ART. XXV.—*Index-Catalogue of the Library of the Surgeon-General's Office, United States Army. Authors and Subjects.* Vol. I. 4to. pp. vi., 126, 888. Washington: Government Printing Office, 1880.

WHEN the War of the Rebellion was being waged, and the magnitude of the issues at stake, with the importance of the results depending upon it were gradually becoming appreciated, it was truly said, that the contest must tend to develop our national life, and to enfranchise us from the dominion of European criticism and opinion. One of these results, evolved from the tears and sorrows of that sad event, is brought before us in the right royal volume whose name is placed at the head of this article, which takes its place with equal step alongside the *Medical and Surgical History of the War*, and like the other publication of the Surgeon-General's Office proves that in the subject of Medical Literature, America may justly claim to have attained a national development, and to stand in the front rank. A catalogue, like the generalizations which follow upon observed facts in science, marks a later growth and a more mature development in the world of letters, and is looked upon with special interest on this account by literary men. American scholars will therefore anxiously scan this book, and regarding it with tender and proper pride, will congratulate themselves upon the progress of which it is a monument.

Yet this handsome volume of over one thousand pages, is but the beginning of the great work undertaken by Dr. Billings, which even when finished will be but a contribution to Medical Bibliography. A very important contribution indeed, as a catalogue of a large collection of books, yet, as the author of the work points out, it is but one collection, and, that by no means a complete one. When it is remembered that this catalogue must stretch through twelve or fifteen quarto volumes before its completion, it would appear difficult to decide which is most to be wondered at, the marvellous extent of medical science, the prolific ability of medical writers, or the energetic enterprise of the individual who has undertaken the great work of compiling the catalogue.

The volume comprises a brief but most important introduction describing the aim and scope of the work; a list of miscellaneous abbreviations; a list of abbreviated titles of medical periodicals, which alone occupies one hundred and twenty-six pages; and eight hundred and eighty-eight pages of catalogue proper.

As was foreshadowed in the "specimen fasciculus" issued in 1876, the titles of authors and subjects have been arranged in a single alphabet, it having been found that such an arrangement would be most useful to physicians, though for the use of librarians alone, a separation into two classes might have been preferable.

The rules which Dr. Billings has established for his guidance in the preparation of the catalogue are so succinct and valuable that they are given in full below.

I. Those titles have been selected for subjects for which it is presumed that the majority of educated English-speaking physicians would look in an alphabetical arrangement.

II. Where there is doubt as between two or more subject-headings, cross-references are given.

III. Where both an English and a Latin or Greek word are in common use to designate the same subject, the English word is preferred, and references are given from the others.

IV. As a rule, substantives rather than adjectives are selected for subject-headings. Exceptions occur to this in anatomical nomenclature, as "lachrymal duct," "thyroid gland."

V. In names of subjects derived from personal names, the latter precede, as "Addison's disease;" "Eustachian tube."

VI. Local diseases or injuries are as a rule placed under the name of the organ or localities affected, as "Kidney (*abscess of*);" "Neck (*wound of*). There are exceptions to this, in accordance with Rule I.; e. g., "Abscess (Perinephritic)."

VII. Cases in which one disease is complicated with or immediately followed by another, all placed under the name of the first disease, with the sub-heading "*Complications and Sequelæ*."

VIII. When the main subject of an article is the action of a given remedy in general, or its action in several diseases, it is indexed under the name of the remedy; but if it relate to its action in but one disease, it is indexed under the name of the disease.

IX. The amount of subdivision made under the principal subject-heads depends very greatly upon the number of references to be classed.

X. As a rule, the references are given from general to more special heads, but not the reverse. It is presumed, for instance, that those who wish to consult the literature on "Aphasia" will turn to "Brain (*Diseases of*)," and "Nervous System (*Diseases of*)," as well as to "Aphasia," without being directed to do so by a cross reference under the latter title.

XI. Under the name of an organ will be found the books and papers relating to the anatomy and physiology of that organ. Following this usually come the abnormalities and malformations of the organ, then its diseases, then its tumours, and lastly, its wounds and injuries.

A study of these carefully digested rules is necessary to any one who would use the catalogue with facility, and they are such as will commend themselves to all intelligent physicians, and to those who have had much to do with books, as both practical and eminently sensible.

In this volume are included 9090 author-titles, representing 8031 volumes and 6398 pamphlets; also 9000 subject-titles of books and pamphlets and 34,608 of articles in periodicals, and yet their appalling numbers only reach from "A" to "*Berlinski*."

Of course it is utterly futile to attempt an analysis of such a work which is itself a specimen of most thorough and exhaustive analysis.

The list of abbreviations to titles of periodicals, which, as has before been said, extends over one hundred and twenty-six pages, should receive special notice. On the left-hand side of the page is printed the abbreviated title, while on the right side appears the full one, with a short history of any changes of name or other metamorphosis the periodical has undergone, and if any numbers of it are not in the library their absence is noted. The deficiencies are mentioned, as Dr. Billings informs us, in the hope that he may thereby be enabled to secure them. In this hope every enlightened physi-

cian must join. Incomplete sets of old periodicals are very often useless lumber in a private library, whereas complete sets in the National Library are of great value, for to it every investigator will naturally turn when desiring to consult old records. It is, therefore, earnestly to be hoped that by printing the numbers absent from the library, Dr. Billings will be enabled to attain his end and secure at least one set of every medical periodical in the National collection, for which he has done so much, and which is a matter of proper pride to every cultivated member of our profession. Not only is this work a catalogue, but it aims at being as well an index. This has of course enormously increased the labour of the work, while it has added much to its value.

The appearance and general get-up of the volume is all that can be desired, and testifies to the efficiency with which work can be done at the Government Printing Office.

Enough has been now said to call attention to the value of this work, and it but remains to congratulate the Surgeon-General's Office upon this good beginning of its *magnum opus*. At the same time we would express the hearty wish that Dr. Billings may obtain the encouragement and support he deserves in the prosecution of his labours, and that by the intelligent liberality of Congress he may be enabled to bring them to a successful end.

S. A.

ART. XXVI.—*On Slight Ailments; their Nature and Treatment*. By LIONEL S. BEALE, M.B., F.R.S., Professor of the Principles and Practice of Medicine in King's College, London, etc. 12mo. pp. 353. Philadelphia: Presley Blakiston, 1880.

WE venture to say that among the numerous medical publications issued during 1880, there has been none which will prove more useful to the young general practitioner, for whom it is really intended, than this little volume of Dr. Beale's; while the time of the older physician might be much more unprofitably spent than in its perusal. Dr. Beale takes up all of the numerous minor ills to which we owe many discomforts, and for neglect of which physicians are daily reproached, explains them in a rational and scientific manner, and suggests appropriate treatment for them. Among them are peculiarities of the tongue in slight ailments; offensive breath; nausea; indigestion, its nature and treatment; constipation and its treatment; diarrhœa; vertigo; biliousness and sick headache; neuralgia and rheumatism; the feverish and inflammatory state; the actual changes in fever and inflammation, and common forms of slight inflammation, including sore throat, conjunctivitis, etc. The remedies suggested for these derangements are not new remedies, but they are in the main the correct ones; the methods of their employment suggested are those sustained by large experience, and will be approved of by those having had such experience. They are simple and the better for that.

Dr. Beale has always been an aggressive enemy to empiricism or anything favouring it, and, while anything but a rationalist in religion, is a rationalist in prescribing, and he can generally give a good reason for what he is ordering. In consequence, his prescriptions are of a simple

character, while he has, however, an abundant store of them to draw upon as required.

As stated, his present volume is intended to be elementary. Hence the propriety of some features which ought to be unnecessary to the physician of to-day, as introducing the etymology of such familiar words as anæmia, from α , privative, $\alpha\iota\mu\alpha$, blood; rheumatism, $\rho\eta\upsilon\mu\alpha$, $\rho\acute{\epsilon}\omega$, to flow; œdematous, $\delta\iota\delta\eta\mu\alpha$ $\delta\iota\delta\acute{\epsilon}\omega$, to swell. We are sorry to have to admit, however, that there are still many American medical students to whom the information thus conveyed will be found new.

The book is issued in neat form by Mr. Blakiston.

J. T.

ART. XXVII.—*L'aire de la Selle Turcique*. Par Dr. JOSEPH SAPOLINI, Médecin honoraire du Roi V. E.; Médecin consultant de la Maison Royale, Commandeur de la Couronne d'Italia, etc. etc. Bruxelles, 1880, pp. 66.

THIS very remarkable pamphlet, from the pen of the distinguished Italian anatomist and scientist, Dr. Sapolini, was presented to the Royal Society of the Medical and Natural Sciences of Brussels in 1879, and is indorsed by publication in the journal of the Society. It is devoted to the study of the area of the sella Turcica, and embraces five chapters. The first of these furnishes a detailed description of the sella Turcica, and treats at great length of the sphenoid bone, its development, its embryological relations, and its peculiarities at various ages and in different individuals. In chapter second the author describes the membranes which cover the bones and which envelop the pituitary body. The folds of the membrane protecting this body are spoken of as ligaments, denominated respectively, clino-clinödien, external, internal or carotid, and posterior.

In chapter third the nerves which traverse this region are considered in a most exact and complete manner. Many new facts in their relations are pointed out with certain novel physiological deductions. The study of the vascular supply both arterial and venous of the pituitary body, forms the subject of the third and fourth chapters, and the anastomoses between these vessels and those of the cerebellum are explained and illustrated by cuts. These, as well as those of the remaining portions of the monograph, twenty-eight in number, are excellent in character and very distinct. The circulatory system of the cerebellum is described as a "vascular labyrinth," with neither beginning nor end, and the physiological effects of such an arrangement in varying positions of the head, in sleep, in inspiration and expiration, and during violent exercise are clearly portrayed. The influence of the great sinuses in unloading the cerebral and cerebellar circulation, and the special mechanism by which this is accomplished, are carefully dwelt upon.

The description of the pituitary body occupies the fifth chapter of this work. A large number of dissections and examinations, made with the most minute care, are recorded, and the best methods of injecting the cavity of the pituitary body and its pedicle are given. The existence of a constriction surrounding the canal of the latter, a sort of valve or sphincter, is also, in the opinion of the author, demonstrated and established. The functions of this sphincter, whatever they may be, he believes are regulated by a branch of the sixth pair of nerves.

It is of course impossible, in a passing notice of this extraordinary brochure, to furnish more than the faintest outline of Dr. Sapolini's researches. These have in fact occupied years of study and patient investigation, and, although the author has not as yet realized the object of his studies, the discovery of the function of the pituitary body, still the anatomist and physiologist who reads his pages must feel that a step forward has been taken in the right direction. Such work as that embodied in this pamphlet is never done in vain; sooner or later it must produce good results, for, as the accomplished author writes, it is only by profound studies repeated, "*à outrance*," and based upon anatomical discoveries, that the function of the pituitary body can be brought to light. We trust that his labours may excite others to repeat and extend his investigations, and we sincerely join in the hope expressed in his concluding paragraph, that he himself may live to witness the fruition of his labours, the discovery of the physiological importance of this central organ, the pituitary body.

J. H. B.

ART. XXVIII.—*A Treatise on the Diseases of the Eye.* By J. SOELBERG WELLS, F.R.C.S., Professor of Ophthalmology in King's College, London, etc. Third American edition from the Third English edition, with copious additions by CHARLES S. BULL, A.M., M.D., Surgeon and Pathologist to the New York Eye and Ear Infirmary; Lecturer on Ophthalmology in the Bellevue Hospital Medical College. 8vo. pp. 895. Philadelphia: Henry C. Lea's Son & Co., 1880.

THE merits of Wells's Treatise on Diseases of the Eye have been so universally acknowledged, and are so familiar to all who profess to have given any attention to ophthalmic surgery, that any discussion of them at this late day would be a work of supererogation. The first edition of the book was published in 1869, it appeared in French and German within a few months, and a third edition was issued in 1873. This last has been exhausted, and the book has been out of print for some time. The author was engaged in preparing a fourth edition, the appearance of which was postponed by his illness, and finally prevented by his lamented death.

Though ophthalmic surgery no longer advances with the astounding strides of the early days of the ophthalmoscopic era, it has by no means stood still in the last seven years, so that some corrections and many additions were required to make Mr. Wells's book a standard authority on the ophthalmology of to-day. The task of making these additions and corrections has been undertaken by Dr. Bull, and has been well performed. Very little that is practically useful in recent ophthalmic literature has escaped the editor, and the third American edition is well up to the times. The only important omission that we have noticed is the absence of any account of the metric system of numeration for glasses. This is a serious drawback upon the completeness of the work, as the metric system is rapidly coming into general use in ophthalmic surgery, and those who have no other source of information are likely to meet with cases of refraction reported in an unknown language.

The publishers have been liberal in the important matter of illustrations, which are numerous and good, and selections from the test-types of Jaeger and Snellen have been added. The occasional occurrence of the

initial "H." in editorial brackets, means that additions made to the second American edition by Dr. Hays have been retained.

There have been some valuable publications in ophthalmology since the last edition of Mr. Wells's book was issued, but none that could exactly take its place; no other one work on the subject contains so much and such readily accessible information, or covers so wide a field with the same careful attention to detail. As a text-book on ophthalmic surgery for the English-speaking practitioner it is without a rival

G. C. H.

ART. XXIX.—*Atlas of Skin Diseases.* By LOUIS A. DUHRING, M.D., Professor of Skin Diseases in the Hospital of the University of Pennsylvania, etc. Part VI. *Syphiloderma (pustulosum)*, *Erythema nodosum*, *Seborrhæa*, *Eczema (papulosum)*. Part VII. *Eczema (pustulosum)*, *Impetigo contagiosa*, *Syphiloderma (papulosum)*, *Lupus vulgaris*. Philadelphia: J. B. Lippincott & Co., 1880.

THESE last numbers of the Atlas fully sustain the high character this work has so justly established for itself. It has been Prof. Duhring's purpose not to make it a gallery of the rare cases of disease which the specialist might desire to perpetuate in this form, but to present to the profession at large a series of illustrations typical of the most important affections of the skin in their every-day phases. It may be truly said that, now the publication has so nearly reached the limit originally designed, the subjects have been selected with excellent judgment, and will cover the whole ground within the possibilities of a work of its scope.

The plates contained in the above parts, illustrative of the diseases there specified, are of nearly uniform merit, and are all good, those representing the two forms of syphiloderma being especially praiseworthy. The picture of erythema nodosum, too, is by far the best that exists of this mysterious affection, Hebra's plate being a gross exaggeration of the ordinary appearances it presents. We have also here given us the only satisfactory representation of another disease, of the nature of which we know almost nothing, viz., impetigo contagiosa. With regard to the certainty of the author's statement that, "its contagious nature admits of no doubt," we must, however, beg still to entertain a doubt, and to use in this connection the language which he applies to the theories which have been advanced concerning its parasitic nature—"plausible, but as yet lacking sufficient proof." We can admit as yet but two classes of contagious affections of the skin: the constitutional, including the exanthemata and syphilis, and those of extraneous origin, the parasitic.

The descriptive text which accompanies each plate is as usual brief, plain, and admirable. We trust that the profession will not neglect this rapidly passing opportunity of obtaining such illustrations of skin diseases as will scarcely be offered again in the immediate future.

J. C. W.

ART. XXX.—*A Case of Combined Intra-uterine and Abdominal Twin Pregnancy; the first Child born naturally at eight months; the second delivered alive at term by Laparotomy.* By H. P. C. WILSON, M.D. of Baltimore, Maryland. 8vo. pp. 18. From *American Journal of Obstetrics*, Oct. 1880.

THIS interesting case recorded by Dr. Wilson is in brief as follows: Mrs. B., æt. 24, delivered of three living children at single births, prior to present pregnancy; gave birth to fourth child on April 15th, 1880, one month before her calculation, which from the immaturity of the infant appeared to have been correct. The child was a female, alive, and lived a little over a month. It was delivered under the care of a midwife, and the labour was perfectly natural. Mrs. B. and the midwife recognizing the fact that another fœtus was still unborn, and it not coming in due time, called in Dr. F. Chatard, Jr., who in turn sought the advice of his father; and finally Dr. Wilson was summoned, on April 18th.

Under bromide of ethyl, Dr. Wilson was able to introduce his hand into the uterus, and determine that the organ was single, mobile, and independent of the fœtal cyst; and he formed the opinion from a bimanual exploration that the pregnancy was neither tubal nor interstitial. Auscultation readily detected the sounds of the fœtal heart, but the placental souffle could never be distinguished. The movements of a fœtus and the presence of a surrounding fluid were also recognizable. Moving the tumour did not impart any corresponding motion to the uterus. It was decided by Drs. Wilson and Chatard, and confirmed by Drs. Wm. T. Howard and Alan P. Smith, that the pregnancy was abdominal; acting upon which it was decided to operate by laparotomy as near as possible to the time of her anticipated confinement.

As is usual in such cases, the patient suffered at times with pains like those of labour; and also occasionally with severe colic-like pains, requiring large and repeated doses of morphia for relief. Her pulse varied from 95 to 110, and temperature from 98 to 102°.

The operation was performed on May 11th at St. Vincent's Home, under chloroform. As there had been a diversity of opinion among those not in the consultation, as to the nature of the pregnancy, Dr. Wilson again introduced his hand into the uterus, and passed a sound until its end could be felt on the right side up under the lower surface of the liver. This was a puzzling condition of things, but being confident of his first diagnosis Dr. Wilson proceeded to operate. In examining the adhesions of the cyst its wall was ruptured, and about half a gallon of dirty yellowish amniotic fluid drawn off. Child alive, male, back to abdomen, and in a kneeling position over the pelvis; it weighed eight pounds.

The uterus was found irregular in shape; pelvic portion imperfectly contracted. From the right cornu extended a long process into which the sound had entered, and to which the cyst was attached, as well as to that portion of the uterus just above the brim of the pelvis. The placenta was attached to the lower part of the elongated mass. This prolongation Dr. Wilson believes to be the uncontracted uterus. The sac was sewed to the abdominal wall with carbolized silk, and external incision closed by wire sutures. The operation was performed under carbolic spray, and everything was carbolized; the cord was brought out at the lower angle of the

abdominal wound; operation required an hour and ten minutes for its performance.

Before the operation her temperature was 100° and pulse 104; these gradually arose until at eight hours after the pulse was 130, and temperature 103.6° . After-pains and a troublesome cough greatly annoyed the woman; and a tendency to vomit prevented her being able to take nourishment except per rectum. Two days after the operation the pulse was 136, and temperature 103° ; cough moderated; was able to retain a little milk and lime-water; night temperature 104.6° ; respiration 36. Sixty-six hours after operation, and twenty-four before death, pulse 128; temperature 101.2° ; had a good night; countenance good; cheerful; inclined to joke; retained $\frac{3}{4}$ iv milk and same of lime-water. In seven hours, pulse 135; temperature 104° ; countenance bad; jactitation. Four hours still later pulse 155; temp. 106.2° ; countenance pinched; dirty offensive fluid escaping from wound.

An attempt was now made to remove the decaying placenta, but it was still firmly attached, and the trial brought on a hemorrhage, to control which pressure was made with a carbolized sponge; the gaping wound was then filled with carbolized cotton. The pulse, which was too rapid and feeble to be counted, fell to 138, and temp. to 101.8° ; so that only half an hour before death her condition gave a slight hope that she might survive. The patient after feeling better took a cup of coffee, asked to be raised in bed, turned blue in the face, and expired in a few minutes as if from embolism, 90 hours after the operation. There had been no chill; no profuse sweats; no muttering delirium; no sweetish breath; no sudden and great rise of temperature, or other indications of septicæmia. The child delivered under the operation was alive and thriving at the last accounts.

Autopsy 2½ hours after death.—Abdomen much distended by gas in intestines; no fluid in abdominal cavity; no peritonitis or congestion of the membrane; sac very closely adherent; three distinct placentas, each with its own set of vessels; these were attached to the fundus and left side of the uterus, left Fallopian tube, and upper part of left broad ligament. *There were no indications of the slightest separation of the placenta.* Uterus reduced to about half the size it was at the time of the operation.

On March 3d, 1870,¹ Dr. E. Paul Sale, of Aberdeen, Mississippi, performed a similar operation on a black cripple of 22, and after removing the fœtus discovered that there was a twin in utero. This he removed by the Cæsarean section, and both children lived. The mother died of septicæmia in four days. At the time of the operation she had a pulse of 135, small and weak; temp. $97\frac{1}{4}^{\circ}$, and respiration 37.

In a communication recently received from the operator, he states that one twin died of measles at a year; the other recovered from the disease, but died at 26 months of broncho-pneumonia. They were under the care of the late Dr. John W. Moore.

Dr. John T. Hodgen,² of St. Louis, Missouri, met with an intra- and extra-uterine twin case in a healthy woman of 27, in 1873. She ceased to menstruate in November, 1872. The extra-uterine tumour ceased to enlarge at the end of February, and gradually diminished in size, presenting irregularities in form. On August 17th, 1873, the woman gave birth to the intra-uterine fœtus after a labour of eight hours. The hand in the uterus

¹ N. O. Med. and Surg. Jour., vol. xxii., 1870, p. 727.

² St. Louis Med and Surg. Jour., 1874, p. 411.

detected the tumour to the left, which was reduced to about one-fourth of its former dimensions. In April, 1874, the woman still suffered from pain and tenderness in the tumour, which was about the size of a lemon. Dr. Hodgen believes this to have been originally a tubal pregnancy which burst without much hemorrhage about the fifth month, causing the death of the fœtus, and a limited peritonitis which gradually subsided.

A very minute account has been given by Dr. Wilson of the condition of his patient at various times after the operation, and the plans of treatment adopted to meet the indications of the case as they occurred. As the woman died, notwithstanding the care and skill of himself and colleagues, the result of the operation tends to throw a doubt upon the advisability of removing an extra-uterine fœtus until after death shall have reduced the vascularity of the placenta and its connections, thereby preparing it for an early separation after the operation. The *primary* operation generally saves the life of the child, but so rarely that of the mother, that it is questionable whether any plan of operation or treatment will ever overcome the difficulties which beset the separation of the placenta and cyst. In the Jessop case¹ there was no cyst, and thus a part of the difficulty was removed; but in general the cyst is very vascular, and the placenta has a network of vessels extending into it from all the parts around and beneath it. After the child dies, the liquor amnii is largely absorbed, the cyst loses its vascular character, and the placenta becomes atrophied and carnified; in this condition, although removal in the operation is fatal, the parts have been prepared for exfoliation, and there is far less danger of septic absorption than in the primary operation where the placental sinuses are all open. A woman having an abdominal pregnancy runs a great risk of her life at the maturity of the fœtus; when a form of false labour occurs, in which the cyst may give way: but it is questionable, in view of the results of *primary* operations, whether it would not be safer, except in a few peculiar cases, to wait until the death of the fœtus had occurred, and the changes mentioned effected, by which the *secondary* operation may be rendered far less dangerous to life.

There is a great temptation to perform the *primary* operation in the hope of saving the mother and child, where the diagnosis of abdominal pregnancy is unquestionable; but we must not be too sanguine in regard to the prognosis for the mother. The child's life cannot weigh against that of the mother, in view of the fact, that the former rarely lives beyond a few months or years, when the latter has perished. Our main endeavour should be to save the life of the mother; and experience teaches us that this can best be done by removing the fœtus in a few weeks or months after its death. It is very unwise to postpone the operation and wait for the formation of a pointing abscess; and it may in some instances be equally so, to await the child's death. Each case must be a law unto itself, directed by a wise judgment. What we have to consider are the causes of death after *primary* operation; the dangers at fœtal maturity; the dangers after fœtal death; the risks of nature's efforts at discharge by the abdominal surface, intestines, bladder, rectum, or into the abdominal cavity; and the comparatively minor fatality which has attended the removal of the recently dead fœtus.²

R. P. H.

¹ Trans. Obstet. Soc., London, 1876, p. 261.

² See this Jour. for Oct. 1878, p. 329.

ART. XXXI.—*A Practical Treatise on Fractures and Dislocations.*
By FRANK HASTINGS HAMILTON, A.M., M.D., LL.D., Surgeon to Bellevue Hospital, etc. etc. Sixth American edition, revised and improved. Illustrated with three hundred and fifty-two wood-cuts. 8vo. pp. 909. Philadelphia: Henry C. Lea's Son & Co., 1880.

THE work of Dr. Hamilton is familiar to most of our readers; it has received due consideration in the columns of this Journal as it has appeared in successive editions from the press; and has an established place in medical literature second to none among American contributions to surgical science. It therefore behooves us merely to direct attention to the points of difference which distinguish this edition from its predecessors.

The chapter on General Prognosis, which is entirely new, will be read with great interest by all surgeons, more especially that part of it which consists of a review of Dr. Sayre's report on Fractures made to the American Medical Association in 1874. The table of cases upon which the conclusions of that report are based is carefully analyzed by Dr. Hamilton, and is shown to be but a slender foundation upon which to rear a theory so utterly at variance with the experience and observation of surgical authorities. In the course of his arraignment of Dr. Sayre's opinions, Dr. Hamilton with much force calls attention to the comparative measurements of normal limbs instituted by Cox, Hunt, Wight, and others, and shows the influence asymmetry of the limbs, when existing, must have in affecting the precise and accurate measurement of them, when the seat of fracture and the normal length of one must be the gauge of the other.

The chapter on Fractures of the Patella is worthy of a careful perusal, and is possessed of much interest. That it is upon a subject in which its author is much interested is shown by the fact of his having recently published a brochure containing his views, which has already been reviewed in this Journal. That the rationale of these fractures is not entirely made out to the satisfaction of all surgeons is well evidenced by the great variety of treatment advised by different authors, and the opposing principles laid down by competent surgeons. That the principles which should guide us in our treatment of these cases are not universally admitted is somewhat remarkable, inasmuch as they are by no means rare accidents. As an instance of this divergence of opinion it is only necessary to remark that Dr. Hamilton insists upon the importance of relaxing the quadriceps extensor femoris, holding with the great majority of surgeons, that it has most to do with the separation of the fragments, as it has been the principal cause of the fracture. On the other hand, we have Mr. Jonathan Hutchinson, in the *Medico-Chirurgical Transactions* for 1869, while admitting the prime agency of that muscle in the production of the fracture, denying that it aids in the after-separation of the fragments, and asserting that the muscle is in a paralyzed condition and altogether unable to influence the relative position of the fragments by its contraction. The student who wishes to ascertain the various modes of treatment recommended for fractures of the patella will, by turning to the pages of Dr. Hamilton, find a very full list thereof. He will notice, however, that this distinguished authority upon fractures recommends a very simple apparatus, consisting of oblique turns of a roller applied without reverses above and below the fracture. In addition a posterior carved splint is then applied to the limb, the oblique turns of the roller are firmly secured to it, and the heel is moderately elevated.

Malgaigne's hooks are not thought by Dr. Hamilton to have been more successful than other forms of dressing, yet he thinks they are entitled to a further trial in cases of very wide separation of the fragments, and especially in those cases where a refracture has occurred.

In this connection it may be remarked that there seems to be an increased tendency to resort to the use of the hooks, or some modification of them, and that some of the surgeons to the Pennsylvania Hospital claim exceptionally good results as a consequence of their employment.

We are requested by the author to call attention to the two following errors in the text, the former of which might lead to a mistake in diagnosis, and entail serious results upon both patient and surgeon. On page 665, fourth paragraph, last line, instead of "the arm is shorter, not longer" *it should read*, "the arm is usually longer;" and on page 333, third paragraph, first line, instead of "Ulna" *read* "Radius."

As in former editions, the work of Dr. Hamilton is profusely illustrated, and the appearance of the volume befits its classical position. That the publishers have done their work well goes without saying, but the new firm, which represents the old medical publishing house, have shown an enterprise worthy of their youthful vigour and ancient prestige, by binding some of their recent works, and among them that of Dr. Hamilton, in half Russia, which presents an attractive contrast to the time-honoured sheep and muslin, which have generally, hitherto, clothed medical volumes. S. A.

ART. XXXII.—*Annual Report of the Supervising Surgeon-General of the Marine-Hospital Service of the United States.* 8vo. pp. 218. Washington, 1880.

THE marine hospital service has of late years expanded much in extent and efficiency, and the report of Surgeon-General Hamilton shows that it is rapidly developing into a well organized and very important department of the Government. The report is in great part devoted to details of administration and statistical information, but it is by no means devoid of medical interest; particularly the portion referring to examination for colour-blindness. Dr. Hamilton has given much attention to this important subject, and has done all in his power to urge the compulsory examination of all seamen as well as of pilots. It seems that the Treasury Department, of which the Marine-Hospital Service is a branch, can enforce "pilot-rules" on steam vessels only, and "has no such power over sailing craft, nor over other persons than pilots or masters—a very limited class of seafaring men." The beauty and necessity of this limitation are not evident to the uninitiated, and the recommendation of additional legislation to extend the authority of the department in this direction seems altogether reasonable.

The ability to distinguish promptly and certainly between red and green is almost as important in the night "lookout" at sea as in the pilot, and any one of the crew is liable to be placed in this position; so that Lieut. Schröder, of the Navy, hardly overstates the case when he asserts that persons affected with colour-blindness "are not fitted for active sea duties, and have no business on board ship."

Even within the narrow range of its legitimate authority—the control

of pilots on steam-vessels—the Marine-Hospital Service has not found its efforts to exclude the colour-blind a matter of plain sailing. In February last it was ordered that all persons applying for pilots' licenses or renewal of licenses should be required to present certificates from Marine-Hospital surgeons that they were free from this defect. This order was afterwards so modified that pilots living at a distance from Marine-Hospital Stations were allowed, when applying for renewal of license, to present certificates from physicians of their neighbourhood. Of 2870 pilots examined, 64 were found colour-blind—not much more than half of the usual percentage. Of course those who suffered by the new rules could hardly be expected to take a scientific view of the colour-blindness question or to sacrifice their personal interests to the public good without resistance, and urgent appeals were made to the Inspector-General in their behalf. In consequence of the violent opposition that the order excited it was subsequently so far modified as to allow such persons as had been reported by the surgeons "incompletely colour-blind" to be re-examined by local inspectors with coloured signal lights; and Dr. Hamilton says "several persons who were found by the examining surgeon to be green-blind, but capable of distinguishing other colours, were afterwards examined with signal lights by local inspectors and furnished certificates." Such persons can only be said to have been examined "in a Pickwickian sense." It would be small consolation for the victims of disaster from collision, as they disappeared beneath the surface of the water, to reflect that the pilot, to whom their lives were sacrificed, was sound on all the other colours though doubtful about green, even supposing such a condition to be possible.

It is impossible to insist too strongly upon the utter futility of testing by coloured flags and lanterns, which, indeed, may be a source of danger rather than safety by inspiring a false confidence. It has been often explained that colour-blind railroad men and seamen learn to guess very accurately at the colour of these familiar objects, under *favourable conditions*, by means of the difference in the intensity of the light that proceeds from them, and that such tests afford no reliable indication as to the acuteness of the colour-sense. In actual practice favourable conditions do not always obtain and, as Dr. Jeffries says, "a mixture of white and black in proper proportions to represent the luminosity of any shade of red or green will give the colour-blind the same sensation as that shade." A case quoted by Dr. Hamilton illustrates this very well. It is that of an employé of the Illinois Central Railroad in whom colour-blindness had been detected by Holmgren's worsteds, and whose friends requested a test by coloured flags. Two bright flags, red and green, were selected and displayed directly in front of a window ninety feet from the man examined. He answered promptly and correctly for some time, but, just as the examination was about to be concluded in his favour, he showed some hesitation which suggested further testing. The red flag was then carried outside the building, about 400 feet away, and in front of a back ground of green foliage, and was confidently pronounced green.

If the examinations cannot be made by ophthalmic experts or specially trained surgeons, the use of the ingenious apparatus described by Dr. Wm. Thomson in the *Medical News and Abstract* for December, 1880, is vastly superior to this flag and lantern farce, and in the hands of intelligent and unprejudiced laymen may give good results.

We cannot always be sure of bright fresh flags, clean lanterns with

good lights, and a clear atmosphere; none of these conditions can be safely controlled, and the only thing to be done is, by a careful process of selection, to adapt the men to their environment, and to trust our lives only to engineers, flagmen, lookouts, and pilots who have the full average acuteness of color sense.

G. C. H.

ART. XXXIII.—*Transactions of State Medical Societies.*

1. *Medical Communications of Massachusetts Medical Society.* Vol. XII. No. VI. 1880. 8vo. pp. 353–471, 163–190. Boston, 1880.
2. *Transactions of the Medical Association of the State of Missouri,* May, 1880. 8vo. pp. 164. St. Louis, 1880.
3. *Transactions of the Iowa State Medical Society,* for 1879 and 1880. Volume IV. 8vo. pp. 251. Des Moines, 1880.
4. *Transactions of the State Medical Society of Kansas,* 1880. 8vo. pp. 107. Lawrence, 1880.

1. THE "Annual Discourse" before the *Massachusetts Medical Society* was read by THOMAS H. GAGE, M.D., of Worcester, who, selecting for his topic, the *Prevention of the Spread of Typhoid Fever*, considers particularly the practicability of preventing, or at least of diminishing the spread of typhoid fever, by systematic disinfection of the patient's intestinal discharges. This duty is too often neglected by the practitioner, who permitting the virulent material to be thrown into shallow cess-pools (perhaps, subsequently, to be used for manure), thus directly aids in the propagation of the disease. Dr. Budd's excellent rules are appended, which should be generally followed; they include disinfecting the discharges with copperas and carbolic acid; and boiling all soiled linen with chloride of lime, or with MacDougall's or Calvert's powder, with greatest attention to cleanliness and ventilation.

Dr. WM. F. WHITNEY, of Boston, read a paper on *Bacteria and their Relations to Disease*, in which a brief sketch of the classification (Cohn) and mode of development of bacteria is given, and is followed by a consideration of the points in favour of regarding them as originators of disease. In summing up the present state of this question, a recent writer on the subject (Koch) says that—

"The numerous occurrences of micro-organisms in cases of disease and the experiments standing in close relation, make the parasitic nature of these diseases probable. Still a complete proof has not been given as yet, and can only be, when it is possible to find the parasitic organisms in all cases of the disease, and further to show them in such quantity and distribution, that all the occurrences can be explained, and finally to demonstrate for each separate disease a morphologically well-characterized parasite."

The author says "that gangrene of the spleen is the only one which fulfils the conditions, although the diseases studied by Koch on animals very nearly do so." In conclusion he expresses a doubt whether some analogous processes will ever be explained by bacteria, since other causes may be at work—

"which we can as little recognize as could our forefathers the bacteria, which are everywhere around us. . . . And even admitting all to be proved as desired, it is not to be forgotten that it is *but the cause* which has been found, and the real changes which lie in the cell and constitute the essence of the disease are as far off as ever."

In a short paper on the *Antiseptic Treatment of Empyema*, Dr. ARTHUR T. CABOT, gives the histories of four cases in which drainage tubes were introduced after opening the chest under carbolized spray; the pleural cavity being washed out daily with solution of carbolic acid (1 to 80). This method of treatment is advocated in place of repeated aspiration, which is rarely curative in empyema.

Diphtheria and the Resulting Paralysis is considered briefly by Dr. A. F. REED, who expresses the opinion that it is by no means settled that special germs are necessary to produce each so-called specific disease, and evidently inclines to the view that the origin of diphtheria may be in a poison common to several zymotic diseases, as scarlatina, measles, typhoid and puerperal fevers and the like, and cites cases in which these several diseases appear to spring from the same source. In discussing the resulting paralysis, after endorsing the views of Gubler, Weber, and others, that the disorder is located primarily in the nerves of parts affected, he calls attention to the fact that there may be a susceptibility to paralysis in certain cases, and the probability that those whose nervous powers had been most heavily taxed, were more liable to this sequel than the laboring class.

Dr. CHAS. H. COOK, of Natick, communicates a very interesting case of pyæmia following a cold, in a paper entitled *Pyæmia of Doubtful Origin, Apparently Spontaneous*; in the case, however, there was old perimetritis, and the exposure occurred just prior to menstruation, no other cause could be determined. The word spontaneous is used to indicate that the disease cannot be traced, but does not necessarily commit one to the theory of spontaneous generation.

The *Importance of Early Recognition of Ear Disease*, is the title of a paper by J. ORNE GREEN, in which repeated testing with the voice and the watch is urged in every case in which auditory symptoms are present, with a view of instituting treatment before thickening, hypertrophy, and adhesions occur, which place the case beyond the reach of therapeutic art.

2. The Transactions of the Medical Association of *Missouri*, form a beautifully printed, neatly bound, and very attractive volume. The "Annual Address" by the retiring President, Dr. MAUGHS, of St. Louis, on *Medical Ultraisms*, draws a contrast between medicine of thirty years ago and of to-day, and regrets the tendency to the neglect of general treatment in preference for local methods which is greatly encouraged by specialism. After referring to the rise and rapid decline of Sims's bilateral splitting of the cervix, the author predicts a similar fate for "normal ovariectomy," believing that the occasions demanding its performance and justifying it are of very rare occurrence.

This address is well supplemented by Dr. ENGELMANN's paper, entitled *The Simplest Uterine Manipulations and Operations and the Accompanying Dangers*, of which the following are the conclusions:—

"1. Uterine manipulations necessitate the greatest possible caution, especially in first examinations; but, even the oft-treated organ may, in an apparent freak under unknown conditions, resent a most trifling interference.

"2. No manipulation or operation is without danger; and before attempting either, certain physiological and pathological conditions must be guarded against, menstruation, pregnancy, and involution, on the one hand, and the remnants of cellulitis and peritonitis on the other. These precautions may be often neglected, but now and then a punishment swiftly follows.

"3. During operations we must moreover observe:—

"a. The sanitary condition of the city. The existence of epidemics, especially

of puerperal fever, erysipelas or diphtheria, decidedly contraindicates operation; and it seems that the spring of the year is most fraught with these dangers.

"b. Absolute cleanliness, if not Listerism in its details, as far as applicable.

"4. After operations—I am still referring to the most simple—the patient must be at least for a reasonable time confined to her bed. Upon this the surgeon must insist, however ridiculous it may seem to the patient without ache, pain, or discomfort of any kind."

This paper is most candid and timely, and should be read by every one who ever treats diseases of women. Several deaths and other serious accidents from the simplest manipulations in uterine surgery, are particularly considered, and in the interesting discussion which followed, several other interesting instances were reported.

Dr. CHAS. A. TODD contributes a good, short paper on the *Dry Method of Treatment of Discharges from the Ear* in which insufflations of borax are especially recommended. Dr. F. J. LUTZ reports a case (æt. 17 years) of a large *cyst of the broad ligament* requiring *laparotomy* which was followed by recovery, and makes some remarks upon Abdominal Surgery. *Resection of the Infra-Orbital Nerve and Spheno-Palatine Ganglion* is recommended in peripheral neuralgia, by GEO. HALLEY, M.D., and two cases reported in which it was performed with success. Dr. A. J. STEELE, reported a case of *Deformity at the Wrist-Joint* following a fracture of the ulna, where contraction of the *flexor carpi ulnaris* had resulted, the hand being in a state of constant flexion. Tenotomy was performed, and false ankylosis broken up, the hand being put in plaster bandage at first and subsequently in a peculiar double moulded metallic splint which allowed passive motion of the wrist.

Dr. H. H. MUDD, of St. Louis, in place of the report on Surgery, furnished an essay upon *Lithotomy and Lithotripsy* claiming a field for each operation, the latter being the operation of election, especially when performed according to Bigelow's method. The same author furnishes a report of a case of epilepsy following depressed fracture of the skull in the cortical motor centres corresponding with the right arm and hand in which convulsive movements occurred seventeen days after the receipt of the injury; the wound having healed, and no fracture suspected; but the cerebral localization pointed to the proper position in which to apply the trephine; the operation was followed by decided relief.

The report on *Medical Education*, by Dr. S. S. LAWS, shows a decided advance in the conditions and requirements for graduation, and in the methods and facilities for teaching in the medical schools of the State.

3. The transactions of the 27th and 28th annual meetings of the *Iowa Society* are contained in this volume.

In a suggestive but quite brief paper, Dr. D. SCOFIELD, considers *Pyrexia as an Element of the Typhoid Condition*, in which the elevated temperature is shown to be connected with increased tissue change, and the observation made that these products of metamorphic change are toxic and cause not only elevation of temperature but also glandular enlargement. It is further stated that the autogenetic poison of pyrexia and the specific poison of typhoid fever are in many respects similar, each having a tendency to the same organs and glands and both are alike amenable to the same general plan of treatment, which is to "speedily reduce the temperature, and call into increased activity the secretory organs of the body."

Dr. M. G. SLOAN, in remarks on a series of thirty-four cases of diphtheria, only one of which was fatal, strongly recommends sulpho-carbolate of

sodium, in doses of thirty grains or less in solution, every three or four hours, alternating with quinia and chlorate of potassium in ordinary doses. Monsel's solution and glycerine (1 to 4) was gently applied to the throat once daily. As a gargle, chlorine mixture was used when the patient was old enough. Frequent inhalations of vapourized lime water and carbolic acid, were practised. In four of the cases the disease extended into the larynx.

A New Method of Treatment for Arresting Puerperal Eclampsia, and other Convulsions, as recommended by Dr. G. M. STAPLES, consists in the hypodermic injection of Norwood's tincture of veratrum viride (gtt. ij-v) and tinct. aconite (gtt. ij-iiij) every twenty or thirty minutes, for three or four times. Several cases are communicated in which these injections were followed by arrest of convulsions even when albuminuria existed.

Dr. REUBEN SEARS arrives empirically and by study of his cases at the same conclusion in regard to the *treatment of Typhoid Fever*, and pronounces in favour of the plan that has been recently revived under the recommendation of Liebermeister, Aitken, and others, and is satisfied from thirty years' experience that in those patients treated with calomel in the first week, the disease runs a much shorter course and is less likely to have complications.

The external use of tobacco in milk-leg or crural phlebitis, in the form of a plaster, is highly recommended by J. L. POWERS, M.D.

Dr. J. WILLIAMSON reports a case of *Ovariectomy by Enucleation, with remarks on the value of Quinine and Opium in the After-Treatment*. This case deserves especial mention as it was performed without any formal attempt at antisepsis, and reliance was placed upon large doses of laudanum and quinia given by the rectum. In ten days' treatment she took 450 grains of quinia, seven and a half ounces of laudanum (6 drachms per diem), and fluid beef ten pints. The case was a severe one with numerous adhesions, having existed fourteen years. Careful preparatory treatment after Dr. Bozeman's method was practised.

A case illustrating the difficulties of surgical practice in the country, overcome by the skill and ingenuity of the surgeon, is one of *Successful Exsection of part of the Femur*, by Dr. J. W. SMITH, for a compound fracture (diastasis) of the lower end of the femur. An equally good illustration from a medical point of view, is a successful *case of transfusion* in hemorrhage from abortion by Dr. L. P. FITCH, where the blood, furnished by the husband, was drawn into a tea-cup, defibrinated with a three tined table-fork and injected with a uterine syringe into a vein at the bend of the arm, subsequently repeated with a Davidson's syringe and an aspirator needle, injecting equal quantities (about three ounces each) of milk and blood (about 99°). Whiskey and morphia (gr. ¼) were administered hypodermically. A week after the operation she was well.

The concluding paper is a report of a *Successful Case of Paracentesis of the Pericardium*, by Dr. G. M. STAPLES. The case was a little girl, 9 years of age, who had suffered for several months with rheumatism. She had almost constant dyspnœa, and for a week or more her breathing had become so oppressed that she was obliged to sit in a chair all night. Chloroform was administered, and an aspirator needle inserted in the sixth intercostal space about one inch to the left of the nipple, and inclined over to the right. Sixteen ounces were withdrawn, with immense relief, and the child ultimately recovered. As this operation was performed June 7, 1877, it is the second successful operation of the kind performed

in this country. Two years and a half later death occurred, and dilated and hypertrophied heart, with adherent pericardium, was found complicated with mitral insufficiency. No trace of the operation remained.

4. In the *Kansas* volume Dr. J. A. COOXs furnishes a report of a case of *neuromatous tumour, with excision of a section of the Sciatic Nerve*, where marked relief from pain was experienced, without decided paralysis, as "he was not only able to walk but performed considerable labour on the farm." He subsequently died from a return of the disease.

In an article upon *Antiseptic Surgery* Dr. T. S. FLOYD recommends a diluted fluid extract of eucalyptus (1 part to 7 of water), or the oil, as being excellent antiseptic agents for the treatment of wounds.

In a report on *Diphtheria*, Dr. J. ROSS recommends treatment with permanganate of potassium (gr. $\frac{1}{8}$) alternating with fluid extract of belladonna (gr. $\frac{1}{4}$) every two hours; with spray (of chlorate of potassium, hyposulphite of soda $\bar{a}\bar{a}$ $\bar{z}$ j, tincture of capsicum $\bar{z}$ j, alcohol $\bar{z}$ j and water $\bar{z}$ iv), every hour or two, to the throat
F. W.

ART. XXXIV.—*The Skin in Health and Disease*. By L. DUNCAN BULKLEY, M.D. 16mo. pp. 148. Philadelphia: Presley Blakiston, 1880.

The Skin and its Troubles. Square 16mo. pp. 94. New York: D. Appleton & Company, 1879.

THESE two little volumes may be properly considered together as their general scope and aim are similar. Dr. Bulkley's reputation as a dermatologist insures the accuracy and usefulness of any work bearing his name, and the peculiar features of this book, the fulness of detail on the everyday care of the skin, the prevention of preventible eruptions and their hygienic treatment, and the common sense advice given, all show the practical cast of mind of its author. The book is divided into four parts: 1. The anatomy and physiology of the skin. 2. The care of the skin in health. 3. Diseases of the skin. 4. Diet and hygiene in diseases of the skin. Of these the only weak part is in the third division where, forgetting that he is addressing a popular audience, Dr. Bulkley gives an elaborate classification of skin diseases suitable only for the student of dermatology and follows it up with a description of the various affections ordinarily described in the text-books, some of which are so rare as to be scarcely ever seen even by the specialist. This is the only blemish in a book which otherwise is in every way to be commended.

Of the second book under notice it is to be remarked that although bearing the imprint of an American firm it is an English production, filled with foreign words and allusions, and much less practical in tone than Dr. Bulkley's primer. The writer has evidently produced his book with great ease, *currente calamo* in fact, for it seems as if it might have been thrown off at a sitting. While it does not compare with its American rival, this anonymous production is interesting reading and contains many facts worth knowing particularly regarding the hair, cosmetics, etc.

A. V. H.

ART. XXXV.—*St. Thomas's Hospital Reports*. New Series. Edited by Dr. ROBERT CORY and Mr. FRANCIS MASON. Vol. X. 8vo: pp. xv., 491, 64. London: J. & A. Churchill, 1880.

DR. THOMAS B. PEACOCK, one of the consulting physicians to the hospital, furnishes a *Statistical Report on Cases of Rheumatic Fever treated during the years 1872 to 1876 inclusive*, in which, in a total of 394 cases, the mortality was only 1.5 per cent. No details, nor even mention of treatment, are communicated to explain this excellent result. Of the whole number 129, or 32.7 per cent., had some form of decided recent cardiac disease either alone or combined with old disease, and 40 others had old heart disease, so that there existed cardiac complication, either recent or old, in 169 cases or 42.8 per cent. (one case in 2.3); the proportion of recent cardiac disease being, as usual, greater in earlier periods of life. In by far the majority of cases the signs of cardiac disease were present at the time of admission; it is not therefore to be attributed to the treatment but rather to the neglect of treatment that this complication appeared.

An interesting but inconclusive paper is contributed by Dr. WILLIAM H. STONE, *On Hysteria and Hystero-Epilepsy*, in which hysteria is first condemned as a misnomer and finally adopted to indicate a functional neurosis, the outcrop from an inherited sensitive and mobile mental diathesis, under the influence of favourable conditions for its development. The following table of functional neuroses indicates the relationship of hysteria to other affections of this class.

“(1) In the first and commonest instance, the effect of sudden or chronic overstrain falls on the intellect, and causes the ordinary symptoms of insanity; or (2) it may lay hold of the emotions and the will, giving rise to the pseudomorphic phenomena of hysteria; or (3) the vaso-motor system of nerves may be overwhelmed; in which case we have exophthalmic goitre and its attendant circulatory derangement; it may (4) fasten on the motor tract of the spinal cord, and generate chorea which will be shown presently to come close on some forms of mental derangement; or (5) on the basic ganglia of the brain, when epilepsy is the result; or, lastly (6) on the inhibitory nervous apparatus of the heart causing a peculiar but easily distinguishable form of palpitation.”

Illustrative cases are given of these different forms of nervous derangement, in which various hysterical phenomena were present.

The accessory symptoms of hysteria, especially anæsthesia, and hemianæsthesia, convulsions and delirium, are discussed to some extent, particularly the supposed influence of the magnet in the asserted phenomena of *le transfert* of Charcot. The observations of Charcot are criticized on account of their depending so largely upon subjective testimony of the patients; and also on the ground of a want of correspondence between the results claimed and the physical laws of magnetism. Experiments made by the writer, with a large electro-magnet upon himself, were with absolutely negative results; and Faraday's statement is also quoted that “he had never been able to trace the slightest physiological effect, whether sensorial, motor, or hypnotic, on himself when using the strongest magnetic fields then attainable.” However, the application of more powerful currents to medical purposes, which are made practicable by the dynamo-magnetic machine may yet yield some decided physiological and therapeutical results.

In a continuation of this paper, the full notes of two cases of hysterio-epilepsy are communicated in which the usual convulsive and paræsthetic phenomena were present and in which an apparent transfer of sensation followed the application of gold pieces to the skin, and subsequently anæsthesia disappeared after the application of a strong magnet. These phenomena as yet are without satisfactory explanation. The symptoms referable to the sense of sight, achromatopsia, and the like, are of much interest on account of their capability of being subjected to scientific investigation for accurate record and comparison from day to day, so that the statements of the patient may be verified or corrected. The precision of the results and the rigid methods pursued are distasteful to the hysterical subject, and these defects are, therefore, readily curable in most cases because the interest of the patient is enlisted in aid of the ophthalmic surgeon, an aid which is often lacking to the physician in treating the histrionic, emotional and gymnastic displays that are so familiar in so-called hysterical subjects.

Dr. ORD communicates the history of *A Case of Aneurism of the Aorta treated by Galvano-puncture*, in which a dilatation of the ascending part of the arch, with hour glass bulging between the second and fourth ribs, was treated with good temporary results by electro-puncture, using a Stöhrer battery, the current from 8 to 18 cells (size of plates not stated). Four insulated needles connected with the negative pole were introduced; the positive electrode was a sponge applied over the tumour. The patient died forty-nine days after the operation from the coagulation extending into the innominate artery. The specimen was placed in the museum. The track of the needles did not ulcerate.

The use of ergot is recommended in the treatment of internal aneurism, as a palliative, for regulating the blood pressure. The paper concludes with some extended observations upon the diagnosis of thoracic aneurisms; the physical signs being principally pulsation, in a position normally free from pulsation, tumour or bulge, thrill, murmur, and diastolic shock.

This paper is followed by a separate one in which the author gives the clinical histories of nineteen cases of aneurism.

The Initial Eruptions of Smallpox is the title of a short paper by SEYMOUR J. SHARKEY, M.B., Assistant Physician to the Hospital; in which twelve illustrative cases are quoted and several diagrams introduced. Two principal classes are distinguished; (I.) Erythematous, divided into (a) general (scarlatiniform, morbilliform) and (b) partial erythema (of extensor surfaces, of flexures), and (II.), hæmorrhagic (a) petechial, (b) consisting of larger hæmorrhagic area. Considerable attention has been directed to these initial rashes of smallpox of late years, especially by Dr. Osler of Montreal, and some German writers; they appear to be particularly marked in certain epidemics.

A Fatal Case of Poisoning by Santonin, in which six grains caused the death of a child five years old in thirty-five minutes, is reported by W. J. KILNER, M.B., convulsions appeared within a minute or two after giving the remedy (by mistake), and unconsciousness came on almost as soon. The post-mortem revealed healthy organs except the stomach, which presented patches of inflammation on its mucous surface in the greater curvature near the pylorus. The duodenum was inflamed throughout, the inflammation terminating abruptly with the termination of this part of the intestinal tract.

The paper concludes with some extended remarks upon the chemical properties of santonin, and the following note may have some clinical value : "The urine of a person, who has taken santonin, is a greenish-yellow, which turns crimson upon the addition of one of the alkalies or alkaline earths. The colour is intensified by heat. Of these reagents potash is the most delicate. . . . Nitric acid produces a transient purple, turning red ; sulphuric acid a brownish-purple changing to a brown."

Dr. JOHN HARLEY presents a second communication on *Fool's Parsley* (*Æthusa cynapium*) in which he re-affirms the statement made in his former communication to these reports seven years ago, that the plant could be eaten with impunity, and shows that extracts of the fruit, leaves, or of the root, have no physiological effects upon man. The juice of the plant was given to four subjects in quantities from two drachms to four fluidounces without any effect whatever. In two patients suffering with spasmodic torticollis, quantities ranging from one to eight ounces were given with the same negative results. The conclusion of the writer, therefore, is that the statements in many of the text-books (including Ziemssen's *Cyclopædia*), in regard to the poisonous properties of the plant are entirely erroneous, and probably arise from confusion with the greater hemlock (conium), this plant being often called the lesser hemlock.

Notes on the Examination of the Bodies of Fifty Children, born Dead, or shortly Dying (second series), by ROBERT CORY, M.D., Assistant Obstetric Physician to the Hospital, are communicated in order to record pathological conditions, and to illustrate certain medico-legal questions. In two cases of syphilitic disseminated growths in the liver, ascites was present ; the foetus had perished, and had undergone maceration ; a syphilitic history was found in the parents. The spots were put under the microscope, and seen to be in close relation with branches of the portal vein. The liver appeared to be primarily and chiefly affected, although the spleen was also enlarged ; these features were also noticed in two cases of the previous series, making four cases in all, in which it may be stated, also, that the longest interval between the primary symptoms in one or the other parent, and the birth of the child was three years. Vegetations in the heart were an unusual occurrence, which was found in one case, where the child died a few minutes after birth, the disease being in the right side of the heart. Two cases of rupture of the liver occurred in cases of placenta prævia, in both of which turning and delivery by the feet had been practised. In one case (of twins) an ovarian cyst involved one-half of the right ovary ; it was about 20 mm. in diameter. Investigating the streaks in the tubes of Bellini, as an evidence against stillbirth, it was "noticed that streaks in the kidneys were found in *all* the cases which had lived from forty-eight to fifty-six hours, but in none of the others, and that they were always found in *both* kidneys. They were never once seen, though looked for in the stillborn children." A mother suffering from osteo-malacia gave birth to a foetus (after perforation of cranium) in which retarded ossification of the bones was very marked. With regard to the value of the static tests of respiration from a medico-legal point of view, the results showed that no reliance could be placed upon any conclusions drawn from the relative weight of the lungs to the whole of the body, to the liver, or to the kidneys in deciding the question of respiration. Experiments made to determine the effect of a fall to the floor in case of sudden birth with the mother standing, showed that, in the great majority of cases, one or both parietal bones would be

fractured. A table of the measurements, weight, and other data of the fifty cases, is appended to the paper; with a good lithographic illustration of the syphilitic disease of the liver as seen in section, and the streaks in the kidney before referred to.

An Analysis of Sixty-two Cases of Enteric Fever by WILLIAM M. ORD, Physician to the Hospital, and SEYMOUR TAYLOR, M.B., Demonstrator of Anatomy, contains the clinical notes of cases of typhoid, including eight fatal cases. Discussion of these cases is postponed until the next report.

WALTER J. KILNER, M.B., describes a *New Medical Galvanometer*, which offers the advantages of being very sensitive, and although delicate in its action, can be used at the bedside. It apparently offers great precision in measuring the resistance of tissues, and for comparison of the electrical reactions of different parts of the body.

In the *report of the Obstetrical Department*, there are 2007 single births, 16 twin-births, 1 triplet; among the single births 1945 presented by the vertex, and 29 by the breech. The forceps were used in 48 cases, podalic version was resorted to in 9, and cephalic version 3 times; out of their 12 cases of version 4 were still-born and 2 died within twenty-four hours of birth.

Hot water injections were used in four cases for the purpose of arresting hemorrhage, with perfect success. Only one maternal death occurred, with old pulmonary disease.

The usual summary of interesting medical cases is given in the *Medical Report*, which includes two interesting instances of recovery after belladonna poisoning.

F. W.

First among the surgical contents of this number of the St. Thomas's reports are two papers by Mr. EDWARD NETTLESHIP, entitled *Diphtheritic Ophthalmia* and *On Cases of Congenital Day-blindness with Colour-blindness*. The first of these was prepared to be read before the British Medical Association, and an abstract of it has appeared in the *British Medical Journal*. The points of the paper are four, namely, 1. Is it worth while to retain the distinction between diphtheritic and pseudo-membranous ophthalmia? 2. What are the relations between diphtheritic ophthalmia and diphtheritic inflammation of other parts? 3. The conditions of the conjunctiva which favour diphtheritic inflammation; and, 4, the relative frequency of the affection in North Germany and England.

The paper shows considerable research, presenting a full *résumé* of what has been written upon the subject and giving references to the authorities consulted. Some new cases which have fallen under Mr. Nettleship's own observation are given in detail.

In his second paper Mr. Nettleship bases his remarks upon seventeen cases seen by himself. Attention is called to the hereditary element existing in many of the instances of this defect, and the fact is dwelt upon that improved vision in a dull light is a conspicuous feature of them.

Mr. SAMUEL OSBORN, F.R.C.S., Chloroformist to the Hospital, contributes some very interesting *Annotations on Anæsthetics*. The subject is one of great importance, and every contribution consisting of careful observations upon it cannot fail to be of value in aiding surgeons to arrive at a conclusion as to which anæsthetic should be commonly resorted to by them. Mr. Osborn tells us that in St. Thomas's Hospital nitrous oxide is used solely for dental operations, its prolonged administration being considered dangerous. For longer operations the rule is to give chloroform

to children under five, and to adults over sixty years of age. This preference is given on account of the smaller amount of bronchial irritation excited by chloroform, and even this reason for its employment is hardly thought to exist in the case of children. Ether is given in all other cases "*because of its undoubted greater safety*," a statement surely sufficiently comprehensive to satisfy the most ardent advocate for its use.

Mr. Osborn prefers to give chloroform on a simple layer of lint, while he invariably uses a Clover's apparatus for the administration of ether. Many excellent practical suggestions are given as to the precautions to be resorted to in administering an anæsthetic, and the steps to be taken should unpleasant or dangerous symptoms present themselves while the patient is under their influence, but they are not new. Mr. Osborn concludes his article with the following aphorisms, which we transcribe for the benefit of our readers, as sound and embodying the judgment of one entitled to consideration from his ample experience, and because they coincide with the universal opinion of practical surgeons.

1. Always have the anæsthetic given by some one who is in the constant habit of administering it, and who will attend to that solely.
2. Never administer anæsthetics unless absolutely necessary.
3. Neither ether nor any other anæsthetic is absolutely safe.
4. Never keep a patient under the influence of any anæsthetic longer than is absolutely necessary.

Mr. H. H. CLUTTON, M.B., F.R.C.S., Assistant Surgeon to the Hospital, furnishes a paper headed *Jottings from the Surgical Out-patient Room* which narrates several interesting cases, but as they cannot be grouped together we can only mention them by name. They are: Bulbous dermatò-syphilis, occurring in a woman twenty-one years old; compensating hypertrophy of testis in a boy of fourteen; neuralgia and vasomotor disturbance from a scar, following the bite of a dog, in the case of a boy aged fourteen; galactoceles, in a woman of thirty-nine; galactorrhœa, in one aged twenty-four; a fibro-cellular tumour of the perineum in a man aged sixty-seven, and two cases, in which multiple fatty tumours occurred in women respectively forty-three and forty-eight years old. The article concludes with a strong endorsement of the use of Martin's rubber bandages in the treatment of ulcers, and in all other cases which call for continued compression.

On the Surgical Cases in which Lister's Plan of Treating Wounds is Preferable to any other Method of Dressing, is the somewhat lengthy title of a paper by Mr. JAMES F. WEST, F.R.C.S., the distinguished senior surgeon to the Queen's Hospital, Birmingham. It consists of an article read before the Midland Medical Society, in which its author most emphatically endorses the Listerian method of dressing wounds. Mr. West claims that "its practice enables us to undertake certain operations that we dared not formerly perform, and that we may do them with a far greater prospect of success than with any other known method of after treatment." Mr. West then reviews some of the anti-Listerian arguments of Messrs. Savory and Callender, and follows them with his own views and those of others concerning the advantages possessed by the antiseptic method in osteotomy, herniotomy, ovariectomy, excision of the large joints, and in wounds of joints.

It is needless to say that Mr. West is an enthusiastic advocate for the antiseptic plan. Though we may think he attributes to it greater virtues, and paints its advantages in more rose-coloured hues than sober experience

will always find attached to it, yet we may safely say that his experience goes to confirm the opinion of many other surgeons, that in the Listerian method we have a most important and valuable aid to surgical proceedings.

The next surgical paper is one of great interest by Mr. JOHN SIMON, C.B., and Consulting Surgeon to the Hospital, on *Operations for Retention of Urine dependent upon Stricture of the Urethra*. It affords a remarkable illustration of the fact that interest and value are not only to be looked for in something new, for it is a lecture delivered to the Hospital class twenty-eight years ago, and now reprinted. Although so old its conclusions are so sound, that surgeons of to-day may read it with profit, and find much of the fog with which the subject has been surrounded by some modern writings, dispelled by its clear statements. The operation for complete retention first proposed by Mr. Simon, and ever since practised by him is that which is quite commonly known as Cock's operation, in which the urethra is opened by external incision immediately in front of the prostate gland. Indeed it would seem to have been with the object of calling the attention of the profession to the fact that this measure was first formally proposed by him that Mr. Simon has now republished his lecture. Yet Mr. Simon does not think the expedient was original with him, or any other living surgeon, it having been at least partially described by Sir Charles Bell as early as 1838, as a means of escape from what is known as the perineal section. Mr. Simon recommends his operation in those very rare cases where it is impossible to pass the stricture, and in those where urgent constitutional symptoms prevent waiting for gradual dilatation, or where extravasation has already taken place. In any case Mr. Simon only regards it as a palliative measure until the stricture can be dilated, yet in those instances where complete destruction of the canal has occurred and cicatricial tissue has been substituted in its place he thinks it affords as good permanent relief as can be found. It is pleasant to hear those old surgical virtues, patience, perseverance, and anatomical knowledge, extolled by Mr. Simon, and many surgeons of to-day may well profit by his advice.

Mr. WILLIAM MAC CORMAC writes *On a Case of Extrophy of the Bladder in which Granulating Flaps were employed to cover the exposed Vesical Surface*. This method of using granulating flaps was first described and practised by Thiersch of Leipsig, and Mr. Mac Cormac considers it preferable to any of those operations where the skin is turned in towards the bladder. It consists of dissecting suitably sized flaps up from the aponeurotic structures beneath, but leaving them attached at either end until they have granulated and become thickened, when they are separated at the upper end and slid into position. Only one flap is prepared at a time and strips of oiled lint are kept between it and the abdominal surface, which is also granulating, until the proper time to transplant it has arrived. In some cases one flap is sufficient, while in others, as in that of Mr. Mac Cormac, two are required. A successful issue was attained in about a year, which is the usual time, that is such a measure of success was obtained as can be looked for in these distressing cases. Mr. Mac Cormac's paper is very well written, and illustrated with cuts and a diagram, which help to make the steps of the operation more plain than we can hope to do without them.

The title of the next surgical paper is *On Lengthening of the Limb as a Result of Knee-joint Disease* by W. W. WAGSTAFFE, B.A., F.R.C.S., Senior Assistant Surgeon to the Hospital. It is based upon the measure-

ment of the limbs in twenty-five cases of knee-joint disease. The result of these measurements leads Mr. Wagstaffe to think that important aids to prognosis and diagnosis may be obtained by careful attention to them. He thinks that from the limited number of cases he has observed the following conclusions may be formulated: 1. Long-standing disease, in the young and quickly growing, is frequently attended with change in the length of the limb; 2, lengthening of the femur or tibia is more common than shortening; 3, lengthening is most commonly found in the femur; 4, lengthening of one bone may, or may not be, accompanied with lengthening of the other; 5, usually only one bone is affected; 6, in the femur the lengthening varied in his cases from .6 cm. to 3.1 cm., and that in those cases where it existed at all it amounted to an average of 2 cm.; 7, marked alteration in the length of the bone may be regarded as presumptive evidence of disease in it; 8, increased length indicates active inflammatory disease near the epiphyseal line and that when no change of length follows long-standing disease, the affection is probably synovial; 9, the permanence of these changes in length is at present only conjectural, and, 10, that careful measurements will aid in localizing the disease, and in diagnosing its character in young and growing subjects.

We agree with Mr. Wagstaffe in thinking that the number of cases as yet observed with reference to this question are too few to safely base generalizations upon, and while his paper is suggestive we think the normal difference between the two sides of the body, and especially of the lower limbs, shown to exist by the examinations of Hunt, Cox, Wight and Hamilton, is a factor which seriously interferes with estimates based upon such slight differences as 1 or 2 cm. S. A.

Art. XXXVI.—*A Manual of Medical Jurisprudence*. By ALFRED SWAINE TAYLOR, M.D., F.R.S., Eighth American, from the tenth London Edition; *edited with additional notes and references*, by JOHN J. REESE, M.D., Prof. of Med. Jurisp. and Tox. in Univ. of Penna., etc. 8vo. pp. 933. Philadelphia: Henry C. Lea's Son & Co., 1880.

THE American editions of this standard manual have for a long time laid claim to the attention of the profession in this country; and that the profession has recognized the claim with favour, is proven by the call for frequent new editions of the work. This one, the eighth, comes before us as embodying the latest thoughts and emendations of Dr. Taylor, upon the subject to which he devoted his life, with an assiduity and success, which made him *facile princeps* among English writers on Medical Jurisprudence; we regard it as a gratifying evidence of the growing community of aim and interest, which should bind together the mother country and her growing child, that Dr. Taylor should have expended his latest labours in helping to make this foreign edition of his work more perfect. Indeed, despite the prominence which French and German scientists have deservedly attained, no writer can hope to have so many readers as he who writes in the English tongue, and it is this fact which has made the name of Alfred Swaine Taylor as well known in America as in the country which gave him birth.

Of the character of a book so well and favourably known, it is hardly

worth while to speak. Both the author and the book have made a mark too deep to be affected by criticism, whether it be of censure or praise. In this case, however, we should only have to seek for laudatory terms, for though it is incompatible with human nature that two minds should think exactly alike, yet it would be impossible for any candid mind to deny that Dr. Taylor has well accomplished the end he had in view, when preparing this volume.

The practitioner of medicine will find in this condensed work of Dr. Taylor, most invaluable hints, which will stand him in good stead, when called to undergo the ordeal he is sure to meet with, when summoned to appear before a court as a medical witness; and the student who makes himself thoroughly conversant with its details and teachings, may safely assume that he is entitled to be considered a medical jurist, in the strictest sense of the term. Although somewhat abridged from the larger work of Dr. Taylor, in this manual will be found a reference to every thing which can well be regarded as coming within the domain of medical jurisprudence.

Indeed, with successive editions, the "manual" has had such considerable additions made to it, that, upon such a cursory comparison of the two books as we have been able to make, it would seem that the contents of the one, is very nearly equal to that of the other. Then this edition of the manual, has the advantage of having received the author's latest emendations prepared for it, and therefore contains more recent references, and some cases which are not contained in the larger "treatise." The American edition has also the immense advantage of the notes and additions of Professor Reese, together with those of the earlier editors. The editing of other men's writings, is a work requiring both knowledge and discretion, that sufficient may be added to make the book supply the wants of that portion of the public for which it is designed, and yet, that the additions should not be so excessive as to overshadow the original work. It seems to us that Dr. Reese has struck the happy medium, and while the knowledge he is so well known to possess, is shown by the fitness of the notes he has inserted in the text, his discretion is equally shown by their moderate number. In view of the many excellencies, and the comprehensiveness of this book, we are inclined to call in question the wisdom of calling it a "manual" as is done upon the title page. In its pages almost every subject ordinarily met with in works on medical jurisprudence is treated of, while many of them are exhaustively considered, and it would therefore seem justly entitled to the more pretentious name of Treatise.

While we have so much to say in favour of this volume, we think it right to add that in our judgment there is too much law in it for medical readers. The medical expert is not a lawyer, and the attempt to consider his subject from a legal standpoint is very likely to involve him in great difficulties. It is much safer to keep to his own proper province as a skilled medical observer, than to attempt to guide himself by his own knowledge of law, which at best must be superficial. Let the reader of this volume impress upon his mind the facts recorded by its author, with the conclusions he has deduced from them, and he will certainly find them of the greatest service in any medico-legal case in which he may be called upon to bear a part.

The opinions and decisions of Dr. Taylor, being the result of a most extended experience, aided by mature and well balanced judgment, are in every way entitled to be considered as authoritative, and though opposing counsel may quote the various views of other authors, yet an opinion

which can be supported by a reference to this volume, must have much weight, and can never be justly treated with contempt.

In conclusion we must again express our sense of the admirable way in which Dr. Reese has edited the volume—and when we add that it is issued in the best style of its well known publishers, and clothed in the attractive half Russia binding, recently adopted by them, we feel that we have said enough to commend it to the attention of our readers. S. A.

ART. XXXVII.—*Traité de Chimie Biologique*. Par M. AD. WURTZ, Membre de l'Institut, etc. Part I. Paris: G. Masson.
Treatise on Chemical Biology. By AD. WURTZ.

THIS book, the first part of which has recently appeared, gives in extension the lectures delivered by the author in the Faculty of Medicine of Paris. Its aim is to trace, as far as possible, the complex organic compounds elaborated by vegetables from mineral matters, through the various transformations which they undergo in the animal body, until they are finally destroyed and again returned to the air and soil.

It is written in M. Wurtz's clear and vigorous style, so that the average student may read with interest, subjects for the comprehension of which an extended knowledge of chemistry would be required. We give some abridged extracts.

After describing the various properties of chlorophyl, by which plants are enabled to decompose and derive nourishment from carbonic acid gas and water, the philosophy of this property is thus summed up.

“Chlorophyl in solution differs essentially from solid chlorophyl, such as is contained in living plants, by the absence, in the latter, of the fluorescence which characterizes the former; the absorption of light being the same in both kinds of chlorophyl, it may be said that there is an excess of radiation, and consequently of energy, in the chlorophyl in solution which is inactive physiologically. While it lives and acts in the living leaf, the chlorophyl can expend this excess of energy, and can, in the form of affinity, transfer to the atoms of carbon and oxygen, set free from the carbonic acid, the energy existing in the form of vibratory movement in light rays.”

The energy thus derived from the sun by plants is expended by animals in the form of heat and motion.

“The respiratory combustion would communicate to the organism a quantity of heat superior to that which is really manifested in any given time. This excess of energy is exerted in another form. It is consumed in the voluntary and involuntary movements made by the animal. It is converted into mechanical force. Modern physics regards the heat of any body as a mode of motion of its molecules, and it may be conceived that the sum of the individual motions of the molecules, the effect which we call heat, can be transformed into one movement of the mass.”

The albuminoid bodies are well described in about one hundred pages. Many of the described varieties of albumen are shown to depend probably—certainly in some cases—on imaginary differences. The classification of the albuminoid bodies here adopted seems remarkably clear and well arranged. The bodies are classed as follows: soluble albumen and serine (serum albumen); coagulated albumen; fibrin; globulines, including fibrino-

plastic matter, fibrinogen, myosin, vitellin, and casein; syntonines, including albuminose, produced by the action of alkalies on albumen, and acid-albumen, produced by the action of acids. Naturally, the first physiological process considered is digestion, and the alterations in the aliments are traced from the saliva until the debris is finally rejected in the excrements.

Of the gastric juice, M. Wurtz's says:—

“It is thus clearly proved that the acidity of pure and fresh gastric juice is due to hydrochloric acid. It is not so with old gastric juice, or with that which is mixed with food. In the latter, lactic acid is frequently found, as has long since been shown by Leuret and Lassaigne. Lehmann found this acid in the gastric juice of dogs which had been fed only on bones. In cases of bad digestion, the gastric juice has been found to contain even volatile fatty acids, such as acetic and butyric acids. It is evident that these acids are the product of anomalous fermentations which take place pathologically in the stomach. The lactic acid undoubtedly results from a fermentation which occurs normally after the ingestion of certain aliments, or where the gastric juice is allowed to become old.

It may be demanded by what reaction hydrochloric acid is formed in the gastric juice. It results, doubtless, from the decomposition of sodium chloride, and the presence of this acid in the stomach must be related to the alkalinity of the blood. The agent and locality of the decomposition of sodium chloride cannot as yet be determined; we know, however, that the formation of pepsin is independent of that of hydrochloric acid, and that the latter appears in the stomach under the influence of an irritation of the mucous membrane. Pepsin fills the deeper parts of the tubular glands, and these parts are throughout neutral to litmus paper. The acidity appears only in the excretory duct, and it seems that the pepsin is dissolved and carried out by the intervention of the acid, although it cannot be said that there is a veritable combination of the pepsin and hydrochloric acid as was supposed by C. Schmidt.”

The role of the bile in digestion is thus summed up:—

“The bile is capable of dissolving a certain quantity of fatty acids, such as palmitic acid, and even a small quantity of neutral fats. It may so contribute, at least in a measure, to emulsify fatty bodies throughout the intestinal tract. It is shown by the experiments of Bidder and Schmidt and Wistinghausen that oil rises higher in capillary tubes when the latter have been wetted with bile, and also that emulsified fatty bodies pass more easily and with less pressure through animal membranes when the latter are permeated with bile. . . . It results that the bile may assist in the division and absorption of fatty matters, but, as far as the digestion of albuminoid matters is concerned, it is impossible to attribute to it a role analogous to that of pepsin or the pancreatic ferment.

“It is not certain that the *stercorine*, described by Flint, and extracted by him from the excrements, is a well-defined substance. It was obtained in fine needle-shaped crystals, and is coloured red by sulphuric acid. The latter property relates it to cholesterin with which it may be identical, for the method employed for its extraction would apply also to cholesterin. The presence of a small quantity of neutral fats would sufficiently explain the peculiar crystalline appearance and physical properties of the matter obtained, and the latter was not analyzed.”

After giving a full history of the many theories which have been advanced and held with reference to the coagulation of the blood, M. Wurtz concludes:—

“It results from this long exposition of the phenomenon of the coagulation of the blood, that notwithstanding the many labours of which that phenomenon has been the object, it is far from being explained, at least inasmuch as concerns the chemical reactions which determine and accompany it. It was formerly supposed that the blood and other spontaneously coagulable liquids contain fibrin in solution, and that the latter becomes insoluble when it leaves the organism. It is now held

that these liquids contain a principle, fibrinogen, capable of generating fibrin; that this principle alone is incapable of being converted into fibrin, and that it coagulates only by the influence of one or more other matters, furnished either by the white corpuscles or by the hæmatoblasts. The question has thus been contracted, but is not as yet resolved."

M. Wurtz does not accept the theory of Schmidt, that fibrin is the result of the union of two substances, fibrinogen and paraglobulin, and rejects the recent theory of Mathieu and Urbain, based upon the action of the carbonic acid gas contained in the blood. He rather inclines to the idea of Mantegazza, that the coagulation is due to a peculiar condition of the white corpuscles, brought about by the presence of a foreign body or inflamed tissues, and by virtue of which they disengage a substance which causes the formation of fibrin, most probably by acting on the fibrinogen contained in the plasma.

The book concludes with the study of the blood. The various methods for the analysis of blood are fully considered, but the directions given for the examination of suspected blood-stains are rather meagre; the latter question hardly falls within the limits of biological chemistry, yet it seems that more than a page and a half might have been devoted to its consideration.

W. H. G.

ART. XXXVIII.—*Ovariectomy in Italy*. 1. *La Prima Centuria d'Ovariectomie in Italia*. Per Dott. DOMENICO PERUZZI. Lugo, 1878.
2. *La Secunda Centuria*, etc., 1880.

The First and Second Hundred Ovariectomies in Italy, with Statistical Tables and Practical Considerations. By Dr. D. PERUZZI, of Lugo. 8vo., pp. 71 and 39. Extracted from the *Raccoglitore Medico*, series 4, vol. x., n. 2, 3, 4, and vol. xiii., n. 7, 8.

THESE two monographs are evidences of the patient and persevering researches of one who occupies a very distinguished position as an ovariectomist, both from the proportionate number of his cases and his success in their treatment. Of the first hundred operations he performed twelve, and saved seven of the women; and of the second hundred nine, and saved also seven, showing a decided improvement in results.

Ovariectomy was introduced into Italy in 1859, the first operation having been performed by Prof. Vanzetti, of Padua, on March 26th of that year; the patient died of peritonitis. He operated again in 1860 with the same result; and Dr. Peruzzi followed him, in 1865, with the third case also fatal. Vanzetti persevered in the operation until in a period of sixteen years he had had eight cases, all fatal. The first non-fatal case in Italy was the tenth, and in the tenth year of the operation, September 26, 1868. The fortunate operator was Prof. Landi, of Pisa. The cyst was small, unilocular, and non-adherent; and the pedicle was treated by cauterization, being the first so managed. Up to this time the long ligature had failed in three cases; the clamp in two; ligature and transfixing-pin in one; and in one the pedicle was ligated with wire and dropped in. Dr. Peruzzi followed with a successful case on March 4, 1869, in which he used the clamp. These two successes added to the hopes of the operators, so that there was in a few years a large increase of cases treated by the knife. From 1859 to 1872 there were 15 operations, with three women

saved, and in 1872 alone 14 operations, and six saved. At this period the clamp, and ligature with pin, were the favourite hæmostatics, there having been ten clamp cases in 1872, with five saved. From 1872 the operations, with some variations, gradually increased in number from year to year. In 1875 there were 19; in 1877, 20; in 1878, 33; in 1879, 42; and in 1880, up to July 8th, 23; there having been eleven in the month of June alone.

The progressive decrease in the mortality of the cases will be seen by arranging the two hundred into ten groups of twenty each. In the first 20 there were five cures; in the second, 8; in the third, 7; in the fourth, 6; in the fifth, 11; making 37 cures in the first 100. In the sixth 20 there were 10 saved; in the seventh, 15; in the eighth, 13; in the ninth, 13; and in the tenth, 13; making 64 saved out of the second 100, and 101 out of the 200.

The chief operators were Dr. Peruzzi, 14 saved out of 21; Prof. F. Marzolo, of Padua, 10 saved out of 23; Prof. Ruggi, of Bologna, 6 saved out of 9; Prof. P. Landi, of Pisa, 6 out of 9; Prof. E. Bottini, of Pavia, 6 out of 8; and Dr. F. Franzolini, of Udine, 5 out of 8. There were in all 60 operators for the two hundred cases.

In the first thirteen cases the operation was performed without any special precautions against septic infection. In case 37, 1874, Prof. Albanese, of Palermo, first introduced the use of the abdomino-vaginal drainage-tube, which is still in favour with some operators. In the 164 operations which followed, of the two hundred, drainage was used in 69, and a cure resulted in 32. The antiseptic method of Lister was first employed by the distinguished Neapolitan accoucheur, Prof. Ottavio Morisani, in case 83, February 7, 1877. The cyst was multilocular, adherent to the omentum, mesentery, and bladder; a drainage-tube was used, and the pedicle secured by ligature and pin; the woman died of shock. In the second Lister case, only three days later, under Prof. Alfonso Corradi, of Pavia, author of the "History of Obstetrics in Italy," the cyst was unilocular, non-adherent, and the pedicle was ligated and dropped in; the woman recovered. There were but four Lister cases in the first hundred, three of which recovered. The antiseptic treatment soon became popular, and was employed seventy-three times in the second hundred operations. Of the 77 Lister cases 52 recovered.

The question is often asked, "What is the value of Lister's antiseptic treatment in ovariectomy?" and we draw from these tables an answer to the query as follows: We find 26 operations in which there was *ordinary* dressing and a drainage-tube used, and of these 12 recovered and 14 died; 28 cases of Lister method, with drainage, of which 16 recovered and 12 died; and 51 in which the antiseptic method was alone used, of which 38 recovered and 13 died. There are, of course, other circumstances to be considered in estimating the true value of the antiseptic method, but it is quite evident that it has greatly diminished the mortality in ovariectomy as compared with that under the ordinary management and dressing.

Management of the Pedicle.—The earliest cases in Italy were treated with the long ligature, and this has been used in all twenty-three times, with ten recoveries. The ligature and transfixing-pin were next tried, and have saved four out of ten cases. Then the cautery came into use, and saved 10 cases, but failing in three, subsequently was abandoned. The clamp has been employed 54 times, saving 15 out of 37 in the first hundred, and 13 out of 17 in the second, the improvement being due to its

association with drainage, or the antiseptic method. Ligating and dropping in the pedicle has gradually grown into favour, and now, with the Lister method, is almost universally employed, as it has a good record, having saved 50 out of 82 cases.

In order to diminish the mortality still more in Italy, which may be rated now at about 35 per cent., it will be necessary to improve the hygienic condition of her old hospitals, and adopt the method of Keith, of Edinburgh, in the treatment of all cases where there may be adhesions, being careful to cleanse the peritoneal cavity of all blood, and to prevent any possibility of its entering from any torn or cut vessel, by ligation. It is also a question to be considered, whether the drainage tube is not a requisite, for at least a few days, after very extensive peritoneal adhesions have been broken up, as in these cases there is often a large escape of serous fluid which may light up septic inflammation and poisoning if not removed.

Causes of Death.—To peritonitis is assigned the first place, with 38 deaths. Suppurative peritonitis produced death in 3 cases; septic peritonitis in 4; entero-peritonitis, 1; septicæmia, 4; collapse, 27; hemorrhage, 4; cardiac paralysis, 3; shock, 2; pyæmia, 2; intestinal occlusion, 1; intestinal paralysis, 1; phlegmon of broad ligament, 1; uræmia, 1; infectious fever, 1; diphtheria, 1; cancerous peritonitis, 1; carbolic poisoning, 1; and the cause is not mentioned in 3, = 99 deaths.

Influence of Adhesions upon the Result.—In the first 100 there were 60 adherent, and 40 non-adherent cysts; of the 60, 19 recovered, and of the 40, 16. In the second 100 there were 66 adherent, and 28 non-adherent, with 6 the condition of which is not mentioned; of the 66, 39 recovered, and 22 of the 28.

Character of the Cysts.—About 75 per cent. of the cysts are classified either as *multilocular* or *unilocular*. Of 74 of the former 53 were adherent and 21 non-adherent; of the adherent 25 recovered, and of the non-adherent, 10. Of 73 unilocular cysts 40 were adherent, and 33 free. Of the former 23 recovered, and of the latter 20. One-fourth of the operations revealed a variety of solid, or fluido-solid ovarian growths, or cysts of the broad ligament; such as myomas, carcinomas, fibro-cysts, cystosarcomas, sarcomas, epitheliomas, cystomas, etc., 21 of which recovered.

Hernia in the abdominal cicatrix followed the operation in nine of the women saved.

Dr. Peruzzi gives, in addition, three other classes of cases allied to true ovariectomy, as follows:—

1. Laparotomy with extirpation of peri-uterine and other visceral tumours, 20 cases; 5 recovered, 15 died.

2. Exploratory laparotomy, 7 cases; 4 died, 3 recovered.

3. Incomplete operations, 9; all fatal. Adhesions very extensive and intimate.

The ovarian statistics of Italy have much more than a local interest, as they represent, so far as can be learned, the whole mass of operations favourable and fatal, Dr. Peruzzi not having confined his observations to published cases. These tables represent the ovarian cases of a whole country, with all the disadvantages, in many instances, of a want of previous experience, and of the pestilential atmosphere of old hospitals. They present to the eye the progressive experiments made with a view to lessen the mortality of the operation, and the consequent material diminution in the death-rate. To have reversed the proportion of recoveries to

deaths in the second hundred over the first, so as to make the columns read *cured* 61, *lost* 36, *against cured* 37, and *lost* 63, must be a very gratifying exhibit to those immediately concerned in producing the change. Italian surgery is certainly making rapid progress, and we shall not be surprised to find a very decided improvement upon the present figures. The 42 operations of 1879 saved 29 women, or 69 per cent. and those of the present year have thus far produced about the same result. The intimacy of Dr. Peruzzi, and others, with the works of leading ovariologists in this country and Great Britain, and the fashion they have in Italy of going long distances from city to city to be present at each other's operations, must disseminate rapidly every new improvement, and give the benefit of the same to the patient and to science. We have sent in pamphlet form to several surgeons in Italy, Dr. Sims's account of Keith's method of operating, by which he has attained the remarkable saving of 97 women in his last 100 cases. No doubt his plan of treating the peritoneal cavity, the pedicle, and the abdominal wound will find many imitators in Italy, as it has already in the United States. R. P. H.

ART. XXXIX.—*Headaches: their Nature, Causes, and Treatment.* By WILLIAM HENRY DAY, M.D. Lond., Physician to Samaritan Hospital for Women and Children. Third Edition. 12mo. pp. 322. Philadelphia: Lindsay & Blakiston, 1880.

THIS well-printed and handsomely bound little volume is, we think, a valuable contribution to the almost-forgotten *art* of medicine; that art which enabled practitioners of half a century ago to win the almost reverential gratitude of their patients by delivering them promptly from the agony of physical pain. Too often at the present day, a scientific physician as produced by our higher medical culture, expends his energies in an exhaustive effort to solve the problem of diagnosis set before him, and whilst he can tell you to a centimetre how much of a lung is hepatized, or what portion of a convolution is compressed by blood clot, will fail to employ all or even the best means at his command to palliate the sufferings of his patient whilst conducting most certainly and safely to his cure.

The phenomenon of simple headache is so common, and cephalalgia is besides so generally a symptom in serious disturbances of health, that doubtless one-half of our patients call upon us for some remedy against it, and hence we can readily understand that a concise and yet comprehensive monograph like this of Dr. Day should be so generally sought for by the profession as to reach the third edition in the short space of three years.

Our author divides headache in sixteen different varieties, such as the headache of cerebral anæmia, and hyperæmia, nervous headache, toxicæmic headache, rheumatic headache, etc., a chapter of his work being devoted to each form of the disease. After a careful consideration of the peculiarities of each type of cephalalgia, a relatively large portion of the chapter is devoted to the therapeutic agencies at our command for relieving the attendant suffering which is sometimes so intense as to render imminent the loss of reason or of life.

One of the best sections of the book is that upon nervous headache, which is especially prevalent among individuals of high culture, nervous

temperament, and delicate physical organization. Our author inclines to the theory of causation by some pathological alteration of the nervous centres; approves Dr. Fagge's classification of the malady among paroxysmal neuroses; and illustrates an excellent description of the onset and progress of an attack by several recorded cases which have evidently been studied and treated with great care.

Among the therapeutic measures, cold to the head by means of Mr. Thornton's ingenious cap made of coils of rubber tubing through which ice-water is allowed to flow, bromide of potassium, hydrobromic acid, valerianate of zinc, and hydrochlorate of ammonia are advised. Should these be insufficient, the cautious inhalation of chloroform is sanctioned, and hypodermics of morphia or morphia and atrophina strongly urged. Guarana has not proved a successful remedy in Dr. Day's hands, although he admits he has used it in but few cases. On theoretical grounds he argues against its employment in the primary stage of nervous headache, but according to our own experience in several cases, this drug is chiefly and often markedly useful in the early period of an attack. We would suggest to the author a more frequent resort to local abstraction of blood by means of leeches to the temples, not only in this form, but in all the varieties of headaches except those from anæmia; and likewise to counter-irritation with repeated small blisters one inch or an inch and a half square, or by tartar emetic ointment applied to the back of the neck, and feel confident that extended trial of those agencies in obstinate cases will lead Dr. Day to urge them more prominently in future editions of his work.

The concluding chapter upon "Headaches of Childhood and Early Life," is replete with valuable recommendations respecting the hygienic management, etc., of the human organism, during its all-important period of growth, with special reference to a proper and healthy development of the cerebral mass. It deserves the careful attention of every physician, and, indeed, of every parent who justly realizes the infinite pre-eminence of his duty to the coming generation of our race.

J. G. R.

ART. XL.—*American Health Primers.* Edited by W. W. KEEN, M.D.
No. XII. *School and Industrial Hygiene.* By D. T. LINCOLN, M.D.
Chairman Department of Health, Social Science Association. 12mo.
pp. 152. Philadelphia: Presley Blakiston, 1880.

THIS excellent little book ably sustains the character of the valuable series to which it belongs, and will, we hope, do much for the well-being, both mentally and physically, of the coming generation in America. Spencer declares that the first requisite for success in life is to be a good animal, and unless proper care, such as we have lucidly pointed out in this volume, is taken to secure a justly proportionate development of bone, muscle, and brain during the period of growth, an inferior human organism must be the almost inevitable result. The work should be read by every parent and every instructor of youth.

J. G. R.

ART. XLI.—*Handbook of Chemical Physiology and Pathology*. By VICTOR C. VAUGHAN, M.D., Ph.D., Lecturer on Medical Chemistry in the University of Michigan, etc. Third edition, revised and enlarged. 8vo. pp. 351. Ann Arbor Printing and Publishing Co., 1880.

THIS book contains much that is good, omits much that is better, and contains some things that are bad.

With no introduction, no consideration of the matters which are to be absorbed and constituted part of the animal economy, the subject of digestion is taken up, and the whole of its philosophy condensed in ten pages. Oxygen is stated to be a food, while its real rôle is rather the destruction of tissue which really constitutes animal life. Two pages seem but little for the consideration of the saliva, and three and a half pages still less for the study of the gastric juice.

It is said that unboiled "albumen forms a clot when taken into the stomach, and is dissolved with more difficulty than albumen which has been coagulated by heat," but the fact that there is a chemical difference between coagulated albumen and soluble albumen, is overlooked. It would be better that a history of the albuminoid bodies should be given before touching the subject of digestion.

The gastric juice is said to convert albuminoid matters into peptones and parapeptones, the former being ready for absorption, "while the latter must be further changed before they can enter the circulatory system." However, the investigations of Brücke and of Henninger have shown that parapeptone is neither more nor less than imperfectly digested albumen or fibrin, and is in fact identical with syntonin. Dr. Vaughan says, "There is a difference between the peptones formed by the gastric juice and those produced by the action of the pancreatic secretion. In the former instance the peptones are acid albumens; while in the latter they are alkali albumens." But the peptones are neither acid nor alkali albumens. The latter are varieties of syntonin, which, by the way, is not mentioned, while peptones seem to be amides of acids, possessing acid properties to a slight extent, while they also combine with acids. It seems that Dr. Vaughan is unacquainted with the investigations of Henninger on the character of peptones.

In addition to the little that is known of the function of the bile in assisting the digestion of fatty matter, it is said that it "assists in destroying the acidity of the food; precipitates the parapeptones, and carries down mechanically with this precipitate any pepsin that may have passed from the stomach with the food." The utility of this attribute, if it exist, might be questioned.

While there is too little space devoted to the chemistry of the processes of digestion, the directions given for the analysis of the digestive fluids seem unnecessarily full. The process employed by Schmidt for the analysis of gastric juice and the determination of the nature of its acid, is given in full; but this is an analysis which can only be made by a most skillful chemist, and is only interesting as a proof of the nature of the acid in the gastric juice. Nevertheless, the analytical instructions are rather verbose than complete.

Directions are given for the detection of nitrous acid in saliva. It was an idea of Schönbein that saliva sometimes contains nitrous acid, for some saliva certainly does possess the property of giving a blue colour to potas-

sium iodide and starch, but it is by no means certain that this property depends upon the presence of nitrites.

Of Fehling's test for glucose in urine it is said: "It must be remembered that the disappearance of the blue colour of the Fehling solution alone is no proof of the presence of sugar. The blue colour is caused to disappear by the action of the alkali upon the organic matter present. Not only must the blue colour disappear, but there must be a distinct precipitate of the suboxide of copper." Yet the blue colour can only disappear as the result of a reduction, and any reduction of the cupric solution is attributed to the presence of glucose. Indeed, many specimens of urine will be found in which the presence of a considerable proportion of glucose will not occasion the formation of a precipitate of cuprous oxide, but will completely destroy the colour of a cupric solution. The above statement of Dr. Vaughan is then a positive error, for, other things being equal, any urine that will change the colour of Fehling's solution to yellow or red, whether a precipitate be formed or not, must be said to contain glucose.

The book is readable but unsatisfactory, and may diffuse much knowledge while doing but little harm. Wood-cuts of microscopic appearances and of apparatus, are placed at the end as "plates," instead of being introduced in the text.

W. H. G.

ART. XLII.—*An Elementary Treatise on the Function of Vision and its Anomalies*, by GIRAUD-TEULON, Member of the Academy of Medicine, Paris, and of the Society of Surgery, etc. *Translated from the Second French Edition*, by LLOYD OWEN, F.R.C.S.I., Surgeon to the Birmingham and Midland Eye Hospital, etc. 12mo. pp. 153. London: Ballière, Tindall & Cox, 1880.

IN this little book the author "has endeavoured to place the principles of the more abstruse portions of modern scientific ophthalmology within the reach of the general practitioner." The range of knowledge demanded of the accomplished physician has, of late years, widened to such an appalling extent, chiefly in consequence of the cultivation of specialities, as to task his time and industry almost hopelessly. To study successfully all the more elaborate text-books on all the different branches would be simply impossible for any finite being with other work to do; and compact treatises clearly expounding the leading principles of important subjects, therefore, fulfil a real want. This is, perhaps, especially the case with physiological optics, much of which is entirely outside of the general course of strictly medical study, but which, nevertheless, has great practical, as well as theoretical interest, particularly for those who are beyond the easy reach of experienced specialists.

This small volume of Giraud-Teulon is one of the very best of its kind. It is concise in form and full in matter, and the name of its author gives it the stamp of high authority.

G. C. H.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

Function of the Soft Palate and Pharynx.

Dr. FALKSON, in *Virchow's Archiv*, Band lxxix., publishes the result of the investigations on the movement of the soft palate and pharynx, which he was able to make in a case where the naso-pharyngeal cavity had been exposed by the removal of the orbit. He found that, when any word or letter of the alphabet was spoken, the soft palate rose, the pillars of the fauces approached each other, and the posterior wall of the pharynx came forward. This movement was least apparent when *a* was pronounced. It was more noticeable when *e* and *o*, and most so when *i* and *u*, were sounded. When *m* or *n* were sounded the soft palate did not move; when *l* or *s*, and especially *r*, it took on a slight trembling movement. It made scarcely any difference in the height of the soft palate, whether a word or letter was spoken loudly or only whispered. There did not appear at any time to be a complete closure of the naso-pharyngeal from the pharyngo-laryngeal cavity. Falkson attributed the nasal character of the tones, which were well marked in this patient, not to the incomplete closure (which was generally thought to be the cause of nasal tones until Voltolini demonstrated that they could be present when the closure between the nasal and pharyngeal cavities was complete), but to the wide communication which existed between the naso-pharyngeal cavity and the orbit, since, on introducing a tampon the phenomenon disappeared. In singing, the height of the tones did not at first appear to effect the position of the soft palate, but afterwards a regular lowering of the soft palate was observed, as was remarked by Voltolini. The resistance which was necessary to overcome these movements of the soft palate was extraordinary. It required the pressure of the whole fist upon the instrument to keep the soft palate down, and when this was accomplished speech was impossible. Breathing did not affect the movements of the soft palate; but in snoring it rose, and more especially then took on a fluctuating, trembling motion, which was shared by the uvula, while the root of the tongue arched up and narrowed the pharyngeal cavity. The palate rose higher during inspiratory snoring than expiratory; during the latter, however, the root of the tongue was most active. In swallowing, the naso-pharynx was more narrowed, and shut off more completely than during any other action, the palate then being so highly raised as to form a convex surface downwards. The whole of the parts appeared, as it were, wrinkled

and squeezed together; so that Dr. Falkson was of opinion that Voltolini's comparison of this movement to the contraction of the sphincter ani was a most suitable one.—*Lond. Med. Record*, Nov. 15, 1880.

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Part Played by the Stomach and Pancreas in the Digestion of Fat.

A paper appears in the October number of the *Archiv für Anatomie und Physiologie* on the relative share taken by the stomach and the pancreas in the digestion of fatty substances, by Dr. TH. CASH. He begins by pointing out that Bernard long ago proved that the oleaginous constituents of the food must be emulsified before they undergo absorption through the agency of the intestinal, and especially of the pancreatic juices. His experiments were supported by those of Brücke, yet it has not been actually demonstrated that the breaking up of the fats into minute droplets and their investment with a soapy membrane, which is perfectly effected in the lacteals, is already accomplished in the intestine. Dr. Cash's experiments were undertaken under Ludwig's supervision, with this object in view. Dogs were kept fasting for eighteen hours or more. Food was now administered, and four hours subsequently the animal was killed with curare. The abdomen was at once opened and the intestine divided by ligatures into several portions of about a foot in length, so that each part retained the fluid it contained during life. The segments were opened, the contents tested with litmus-paper, and received in test-tubes. A quantity of water, equal to the fluid obtained, was added to each tube, warmed to 60° C., and filtered. After the solid residue had been heated in this way several times with water, the cloudy fluid which had passed through the filter was placed in a cylindrical glass and subjected to centrifugal action for an hour or two. The oily portion of the fluid after this treatment swam upon the surface of the water. The contents of the small intestine were invariably found to leave an acid reaction, and the surface of the fluid which had been subjected to centrifugal action, never presented the slightest tendency to the proper colour of an emulsion, whilst the oil-drops could be easily made to coalesce, and could then be equally emulsified with a dilute solution of soda. It hence appears that fats are absorbed in the free state, and their conversion into an emulsion first takes place after absorption is effected.—*Lancet*, Nov. 13, 1880.

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MATERIA MEDICA AND THERAPEUTICS.

Alkaloids of Hemlock.

Hemlock contains, according to the observations of several investigators, two active principles: conia, having a paralyzing influence on the central nervous system; and another agent, acting like curara. A salt of hydrobromic acid, obtained from hemlock, has an action similar to conia; and Prevost of Geneva has asserted that the paralyzing effect of this salt is due to an action on the motor nerves—*i. e.*, that it also acts like curara. This conclusion has led M. BOCHFONTAINE to make a fresh series of investigations on the action of conia. He finds that it is readily absorbed from the stomach, relieving local pain, and also inducing sleep. It abolishes reflex action and sensibility. After its administration, stimulation of the central end of a divided sciatic nerve causes neither pain nor reflex movements, while muscular contraction is still produced by stimulation of the peripheral portion of the nerve. These effects are diametrically opposite to those caused by curara; and the difference of action is further brought out by

a comparative experiment on two frogs, which shows that conia lessens or abolishes the physiological properties of the nerve-centres, before acting, like curara, on what Vulpian has called the "neuro-muscular junction." In both dog and frog a sufficient quantity abolishes all nervous excitability, but this dose is always fatal.

Regarding the crystallizable salts of hydrobromic acid which can be obtained from hemlock, M. Bochefontaine finds that they may be divided into two groups. One is yellowish, is very toxic, and has the typical action of conia. The other, colourless, is less powerful, and has a different action. It has the same effect upon frogs as curara, but, instead of recovering as they do after a small dose of curara, they do not recover from such a dose of the salt as causes a similar effect on motor excitability. Even a dose insufficient to abolish voluntary movements causes death at the end of two or three days. Successive crystallization of these salts tends to eliminate that which acts on the central nervous system, and to isolate the curarizing principle.—*Lancet*, Nov. 13, 1880.

Action of Pilocarpin on the Pupil.

The mode of action of drugs which affect the pupil has always been a somewhat obscure subject, and an investigation into the mechanism by which pilocarpin contracts the pupil, by Drs. LABORDE and FITZGERALD, is of considerable interest. Five milligrammes of the hydrochlorate of pilocarpin injected beneath the skin of an animal determines, in five minutes, not merely general diaphoresis, but also a strong contraction of the pupil, and this even though the third nerve has been previously divided, so that the central influence on the sphincter is at an end. The drug must therefore act by stimulating locally the fibres of the sphincter, or it must paralyze the sympathetic innervation of the dilating fibres. The local action, although intelligible when the drug is applied locally, is scarcely conceivable when it is introduced into the general system. The action on the sympathetic seems the more probable. If the third nerve has not been divided, and the action of the drug is closely watched, the first effect is a fixation of the pupil in a state rather of mydriasis than of myosis, apparently due to a simultaneous paralysis of both muscles; then the sphincter gets the ascendancy, and the pupil slowly contracts. That such a double action really takes place is shown by the effect of the drug when the sympathetic has been divided, the third nerve being intact. Then, the action of pilocarpin is to slightly dilate, not to contract, the pupil. Thus there is reason to believe that the drug acts as a paralyzing agent upon both sets of nerves to the iris, and the myosis is due to its action upon the third nerve being less than its action on the sympathetic, or to the fact that, when both are paralyzed, the tonic force of the sphincter is the more powerful. It may be noted, however, that Albertoni, and recently Harnack and Meyer, have come to a different conclusion. Finding that when the pupil is strongly contracted by pilocarpin, irritation of the cervical sympathetic still gives rise to considerable dilatation, they believe that pilocarpin causes contraction by stimulating the third nerve. The fact, however, is quite reconcilable with the observations of Laborde and Fitzgerald, since the paralyzing action which they assume may be on the central connection of the nerves, and then stimulation of the trunk would still cause contraction of the dilating fibres.—*Lancet*, Nov. 13, 1880.

Jaborin.

In connection with the slight mydriatic action which Laborde and Fitzgerald observed, it may be remarked that jaborandi has been found by Drs. HARNACK and MEYER to contain an alkaloid, which they have termed jaborin, which dilates

the pupil and has an action on the heart, the salivary glands, the intestines, and the central nervous system, exactly like atropine, and which is found also, like it, to antagonize the action of muscarin. These authors point out that many commercial preparations of pilocarpin contain also jaborin, and the presence of this substance may explain the mydriatic effect of pilocarpin observed by Laborde and Fitzgerald, at the commencement of its action and after the sympathetic had been divided. It is evident that to furnish conclusive evidence that pilocarpin acts on both sets of nerves, their experiments must be repeated with a preparation of pilocarpin from which all jaborin has been removed. It is possible that jaborin may turn out to be actually identical with atropine or with hyoscyamine. Professor Ladenburg of Kiel has lately asserted that there are only two mydriatic alkaloids, atropine and hyoscyamine—daturine, duboisine, and hyoscyamine being not merely closely related but actually identical.—*Ibid.*

Identity of the Mydriatic Alkaloids.

Professor A. LADENBURG, of the University of Kiel, who has already made some important discoveries regarding the constitution and products of decomposition of alkaloids, has just published, in the *Berichte der Deutschen Chem. Gesellsch.*, vol. xiii., 1880, the results of further investigations on the solanaceous alkaloids, atropine, hyoscyamine, daturine, and duboisine. His experiments, which seem conclusive, show that hyoscyamine, daturine, and duboisine, are *identical* with each other, and not merely closely related; and that atropine and hyoscyamine, though not actually identical, are isomeric in composition. He concludes, therefore, that there occur in nature only two mydriatic alkaloids—namely, atropine and hyoscyamine.

In continuation of previous papers, giving the result of his investigations, Professor Ladenburg has announced (*ibid.*, 1880, 607) that he has succeeded in converting hyoscyamine into atropine.

When hyoscyamine is decomposed (with baryta or hydrochloric acid) it forms two new products which were heretofore denominated hyoscyne and hyoscyne acid. Under similar conditions, atropine furnishes tropine and tropic acid. Ladenburg has now ascertained that both the acids, hyoscyne and tropic, and the secondary alkaloids, hyoscyne and tropine, are identical. The author prepared a considerable quantity of the hyoscyne, not however, from hyoscyamine, but from the less costly daturine, the identity of which with hyoscyamine had previously been proven by him. Twenty grammes of commercial daturine yielded ten grammes of hyoscyne. In all physical and chemical properties, the latter agreed with tropine prepared from atropine. The identity of the products of decomposition of two substances which are not themselves identical, was so remarkable a phenomenon that the author was induced to try whether he could not prepare the alkaloid atropine, not from tropine and tropic acid (as he had already done previously), but from the decomposition-products of the other alkaloid. For this purpose the following three sets of experiments were made.

1. Tropine from atropine, and hyoscyne acid from daturine, were treated on the water-bath with diluted hydrochloric acid.

2. Hyoscyne from hyoscyamine, and tropic acid from atropine, were similarly treated.

3. Hyoscyne from hyoscyamine, and hyoscyne acid from hyoscyamine, were treated in the same manner.

The produced alkaloids were precipitated by potassium carbonate, the precipitate dissolved by chloroform, and the latter evaporated. The residue was dissolved in diluted hydrochloric acid and precipitated with chloride of gold. This produced an oily salt, which soon solidified and which was recrystallized from

water. In all three cases the product turned out to be atropine-gold, recognized both by its characteristic colour and by its melting point.

Hence hyoseyamine may be converted into atropine, and, on decomposition, both of these alkaloids yield identical products.—*London Med. Record*, Oct. 15, 1880.

Antagonism between Opium and Belladonna.

In the first two lectures of the Cartwright course, Dr. ROBERTS BARTHOLOW considered the antagonism between opium and belladonna and submitted the following conclusions:—

Morphia and atropia are antagonistic in their effects on the cerebrum, and the result of the antagonism is to induce sopor; but this deepens into coma if the quantity used is larger, and hence the antagonism does not extend to lethal doses.

They are antagonistic in their action on the pupil (though this is not constant), and the effect of the atropia preponderates.

They are antagonistic in their action on the heart, but the effect of atropia is more powerful and prolonged.

They are antagonistic in their action on the respiration; morphia showing the respiratory movements and diminishing the excretion of carbonic acid, and atropia increasing the respiratory movements and the excretion of carbonic acid.

They are antagonistic in their action on the arterial tension; opium slowing the heart and paralyzing the arterioles, and atropia counteracting these effects.

Atropia prevents, to a large extent, and often completely, the depression, cold-sweating, and cerebral nausea caused by morphia.

Morphia and atropia are antagonistic in their action on the kidneys, the one diminishing and the other increasing the urinary discharge. They differ also in their action on the bladder, the one dulling the sensibility of the mucous membrane and impairing the vigour of the muscular coat of the viscus, and the other simulating the sphincter. They are not, therefore, antagonistic in their effect on the bladder.

In therapeutics these antagonistic actions may be utilized to secure effects which cannot be obtained by the employment of either agent alone. The whole subject affords a beautiful example of the success of the methods employed by modern pharmacological research to improve our knowledge of the action of the oldest remedies, and to increase the safety, certainty, and range of their applications to the treatment of disease.—*Med. Record*, Nov. 27, 1880.

On the Subcutaneous Injection of Quinia.

The majority of practitioners agree with Liebreich that the hypodermic injection of quinine sulphate in any of the various forms in which it has been recommended is painful, whilst the results obtained are not sufficiently favourable to warrant its frequent employment. Professor KÖBNER, however, considers that the hydrochlorate of quinine is better suited for this purpose, not only on account of its greater solubility, but because it contains a larger proportion of the base than does the sulphate of quinine, whilst the solubility of the preparation is greater in pure glycerin than in water. Thus Professor Köbner has obtained no good results in cases of intermittent neuralgia and other affections for which quinine is usually prescribed, from the injection of 0.12–0.15 gram of quin. muriat. as are ordinarily obtained from the administration by the mouth of much larger doses (0.6–1.25), whilst the patients did not complain of any constitutional or gastric symptoms. The author gives the following as his formula for four injections: Quinin. hydrochlor. 0.5–1.0; glycerin., aqua destill., āā 2.0. Disp. sine acido.—*Practitioner*, Nov. 1880, from *Der Practische Arzt*, March, 1880.

MEDICINE.

Acute Anæmic Dropsy.

In November, 1878, Dr. CLARENC observed several cases of a peculiar form of anasarca, preceded by vomiting and purging, in the Mauritius. This disease, acute anæmic dropsy, has now become epidemic. The symptoms were anasarca of the lower extremities, often extending to the upper extremities and trunk, seldom to the face, and only in the worst cases complicated with ascites, hydropericardium, and hydrothorax. The dropsy was preceded by diarrhœa or vomiting, or both; with deep-seated pains in the limbs, epigastrium, or abdomen, and was accompanied with slight fever, and in most cases by a rubeolar skin eruption, disappearing under pressure, sometimes ending in petechiæ or phlyctenæ, and desquamation. The disease, sudden in its commencement, followed a chronic course, often lasting from three to six weeks, the tendency to œdema of the feet persisting after the patient felt otherwise well. The patients, generally Indians, were very anæmic, the blood watery, with marked diminution of the red blood corpuscles, and increase of leucocytes and granules. The dropsical swelling disappeared or greatly diminished during the night and increased by day, these alterations being due to position and repose. The dropsy was not only the most obtrusive, but also the most persistent symptom of the disease, and often remained after the patient was able to resume work. When permanent œdema had disappeared, a slight swelling of the feet frequently occurred after a hard day's work or a long walk. The diarrhœa, which, with vomiting, formed one of the premonitory symptoms of the disease, was naturally very severe, the motions being very frequent, and generally yellow, green, or white. It was not obstinate, however, and subsided spontaneously in a few days. The vomiting occurred in about three-quarters of the cases, and was accompanied with slight nausea, and some epigastric distress or pain. The rash generally appeared about a week after the œdema, and continued for about ten or twelve days. On the trunk, thighs, and arms, it was of a measles character, but below the knees resembled erythema. The temperature was generally about 37.2 to 37.4° Cent. in the morning, rising to 37.6 or 37.8° in the evening. The blood, in addition to being poor in red corpuscles, contained irregular masses of germinal matter, and vast numbers of minute, highly refracting granules. The lymphatic glands were not enlarged, and little complaint was made of pain in the spleen. The dropsy characteristic of this affection was evidently the result of the accompanying anæmia. The anæmia is probably due to the action of a poison which affected first the sympathetic system, as shown by the vomiting and purging, before which the patient as a rule exhibited no signs of cachexia. Whether the morbid cause acted directly upon the blood glands is not clear.

This disease resembles "béri-béri" in the dropsy, and acute anæmia which are common to both, but they differ in several respects. Béri-béri is frequently fatal, and was attended with obstinate constipation and distressing dyspnœa, and very commonly by paralysis, but it is not preceded by vomiting and diarrhœa, it is not accompanied by fever, nor does it present a skin eruption. In all these cases it differs from the anæmic dropsy of the Mauritius, which is consequently to be regarded as a distinct disease.—*Practitioner*, Nov. 1880, from *Government Report of Acute Anæmic Dropsy*, Mauritius, 1880.

Tuberculosis.

In a discussion on tuberculosis in the Vienna Medical Society (*Mediz. Jahrb.*, 1880, Heft iii.), Professor BILLROTH reported that of 713 cases of tumour albus

occurring during a sixteen years' observation, 181, *i. e.*, 25.3 per cent., had died with the diagnosis of phthisis; 15, *i. e.*, 2.1 per cent. with miliary tuberculosis of the meninges. In these cases there was not generally pus, but concealed cheesy centres in the bones, and these he believed to result from miliary tubercles (as shown in early resections), and to be the origin of the general disease. Dr. Billroth holds that the theory of the parasitic nature of tuberculosis is not to be cast aside because the investigation of the parasitic element is a matter of great difficulty. While asserting that of hereditary tuberculosis, in the same sense as hereditary syphilis, nothing is known, he says that the parasitic hypothesis must suppose a special predisposition to tuberculosis in certain individuals, and he agrees with Niemeyer's expressed opinion that the serofulous diathesis predisposes to tuberculosis.—*London Med. Record*, Nov. 15, 1880.

Typhoid Fever as a Disease caused by Organisms.

Professor KLEBS (*Archiv für Experim. Pathologie*, vol. xii., parts 2 and 3), has constantly found organisms in typhoid fever in the form of rods and unsegmented threads, as long as 80 micrometres, and having a breadth of 5 to 6 micrometres. The tissue beneath the typhoid ulcer is found to be full of these bacilli. In very recent cases they are found in the interior of Lieberkuhn's follicles; at a later period they pass into the tissue between these glands. In one case, of ten days' standing, in which cerebral symptoms were specially marked, these bacilli were found in spaces in the pia mater. Klebs believes that the local symptoms are in proportion to the number of bacilli present.—*London Med. Record*, Nov. 15, 1880.

New Theory as to the Pathological Changes in the Blood in Acute Rheumatism.

At a late meeting of the Cambridge Medical Society, Professor LATHAM advanced a new theory as to the pathology of acute rheumatism. He maintained that the first step was a lowering of the action of the "inhibitory chemical centre," or nervous centre, which controls oxidation in the muscular tissue. Following upon this, the oxygen from the oxyhæmoglobin, instead of entering the muscular tissue to be exhaled therefrom in the form of carbonic acid gas, had its sojourn in the tissue shortened, and passed into the blood in the form of lactic acid (a substance which appears in muscle almost instantaneously with its death); that the oxygen acted also more energetically on the muscular tissue, and the resulting lactic acid being oxidized rapidly in the blood, instead of the muscular tissue, an abnormal amount of heat or pyrexia was developed.

He then argued that quinia lowered temperature by simply impeding the carrying of ozone from the lungs to the tissues by the red blood-corpuscles, as in Binz's experiments with ozonized turpentine and guaiacum; and so the remedy *might* act beneficially in rheumatism, but would have no effect on the *materies morbi*. Salicylic acid, on the other hand, lowered the temperature and cured the disease by chemically combining with the substances from which the lactic acid is derived, and producing less heat than would result from the oxidation of that substance. He showed how the theory advanced explained the relapses which so often recur after apparent cure with salicylic acid, the necessity for large doses of the remedy, and the reason why it should be less curative in other pyrexial disorders, such as pneumonia, typhoid fever, etc. Referring to locomotor ataxy as an example, he suggested that possibly the local symptoms might be the result of the lactic acid acting upon the posterior columns of the spinal cord, producing functional change; and, in reply to a question in the discussion afterwards as to the connection between rheumatism and chorea, considered that this disorder was the

result of the lactic acid inducing functional change in the nervous centre which co-ordinates muscular movement, that centre being weak, and therefore a point of minimum energy, and this condition being hereditary or acquired. He also applied his theory to explain why the same cause (cold), which in one person appears to produce acute rheumatism, in others produces pneumonia, tonsillitis, etc.

Since the meeting Dr. Latham has extended his theory to diabetes. If it be true, it ought, he says, to explain the phenomena of that disease with a normal or subnormal temperature, and he maintains that the lower nerve action is sufficient to do this. Salicylic acid may then (whilst the patient perhaps is taking ordinary diet) cause the sugar to disappear from the urine and lessen the amount of that secretion without even altering the condition of the nervous system upon which the symptoms depend.—*Lancet*, Nov. 13, 1880.

Active Treatment of Syphilis of the Nervous Centres.

Prof. CHARCOT treats these cases (*Gazette de Hôpitaux*, July 3, 1880) by the administration of a daily dose of iodide of potassium, varying from 75 to 120 grains, using at the same time inunction of 60 to 90 grains of mercurial ointment during the day. At the end of a fortnight this treatment is suspended for a time, while only moderate doses of iodide are given, the more energetic treatment being subsequently resumed.—*London Med. Record*, Nov. 15, 1880.

Treatment of Asthma by the Induced Current.

Dr. I. BURNEY YEO, Physician to King's College Hospital, reports (*Lancet*, Nov. 13, 1880) an exaggerated case of asthma which he saw in consultation with Dr. Richard Schmitz, of Neuenahr, and which had been treated by the application of the induced current, and apparently completely cured thereby.

The patient, a gentleman about forty years of age, had suffered from paroxysms of asthma for more than six years, originally induced, he believed, by a severe attack of catarrh. He had tried numerous remedies and visited various climates, but without any considerable relief. This year he was spending a second season at Neuenahr, but without any relief to his asthmatic attacks. Quite recently he was seized with an attack of unusual severity and duration, which had lasted, with but slight intermissions, for three whole days and nights, when, as all other resources had failed, it occurred to Dr. Richard Schmitz to try the effect of the induced current applied in the manner suggested by Dr. Max Schaeffer of Bremen.¹ The relief afforded was immediate, and after twelve applications—*i. e.*, an application twice a day for six days—the patient appeared quite well. Dr. Yeo examined his chest carefully, and there was no trace of wheezing or of dry or moist râles of any kind. He examined his throat, and found evidence of chronic pharyngitis, the mucous membrane being very granular from the presence of many enlarged swollen follicles; but it was quite clean, and free from mucous secretion. The tonsils were scarcely at all enlarged, although they had been much so formerly. Dr. Yeo mentions these facts with respect to the condition of the throat, as they bear on the theory of the action of the remedy to which he alludes. The influence of the remedy had been so complete that the patient's gait and carriage were totally changed, and instead of assuming the bent, stooping figure of the asthmatic, he walked as upright as his fellows.

The galvanic current had been applied to the throat in the situation of the great nerve trunks, the vagus and sympathetic, each pole being applied just below

¹ Deutsche Medicinische Wochenschrift, 1879, No. 32.

the angle of the jaw and in front of the sterno-cleido mastoideus. The current, mild at first, was gradually increased in intensity until it could be distinctly appreciated by the patient as passing through the soft palate from one side of the throat to the other. It was continued for fifteen minutes at each sitting. It was noticed that the pupils, widely dilated at first, became strongly contracted as soon as the application of the current gave relief. Dr. Max Schaeffer, who has recently advocated this treatment, agrees in the main with Biermer as to the pathology of idiopathic asthma, meaning by *idiopathic* asthma those attacks in the intervals between which no evidence of morbid changes in the lungs can be found. He regards these attacks as a tonic spasm of the middle and finer bronchial tubes; but he looks upon the spasm as secondary, and agrees with Weber in believing the primary change to be a swelling or tumefaction of the bronchial mucous membrane, dependent on a fluxionary hyperæmia, itself due to a vasomotor nervous influence, the principal rôle being played by the pulmonary fibres of the vagus. According to this view asthma is an irritative and reflex pulmonary neurosis.

The morbid state, upon which the asthma depends, may—affect (1) the nerve itself, or (2) the coverings of the nerve, or (3) the tissues adjacent to the nerve.

Max Schaeffer lays great emphasis on the third of these conditions—viz., that morbid states of the structures adjacent to the nerve may influence and disturb the nervous currents. Tumours, such as nasal polypi, hypertrophied tonsils, swollen cervical or bronchial glands (temporary hyperæmia of these glands), can, according to their position, cause irritative pressure on nerve filaments connected with the respiratory centres. He found that many of his asthmatic patients were the subjects of nasal catarrh, or pharyngeal catarrh, or laryngo-tracheal catarrh. He noticed that swellings of the mucous membranes of these parts were attended with asthmatic paroxysms, and patients would constantly refer the seat of their discomfort lower or higher in the throat, according to the seat of the swelling, and he concludes that all the symptoms of asthma are symptoms of irritation brought on by pressure on nerves which are in connection with the pulmonary portion of the vagus, and especially in the upper part of the respiratory tract—the pharynx, larynx, and trachea.

He examines carefully the nose and throat, and applies the electrodes according to the seat of the disease. Usually the two electrodes are placed on each side of the neck about two centimetres below the angle of the jaw, and sometimes a little lower down in front of the sterno-cleido mastoideus. The current must be of good strength, so that the patient can feel the stream go across the larynx and soft palate. In bad cases it should be applied twice a day from fifteen to thirty minutes each sitting. He states that in the most severe cases it has acted “like witchcraft.” He has never found the constant current do any good, but he has never failed with the induced current.

Certainly the result of the application of the induced current in the case that came under Dr. Yeo's observation was very remarkable.

— On Angina Pectoris.

Prof. POTAIN, in a clinical lecture at the Necker (*Gaz. des Hôp.*, August 19), observed that he believed that three forms of this affection can be distinctly recognized, all characterized by agonizing substernal pain, propagated in the paroxysmal form to the upper extremities. It differs from ordinary dyspnœa, as there is no oppression (properly so called), but a kind of constriction of the parietes of the thorax.

1. The first form, symptomatic of a lesion of the coronary arteries, may be re-

garded as terminating fatally in death. The lesions may vary somewhat, but Prof. Potain agrees with Jenner that they usually consist in obstruction of the coronaries. In thirty-six cases lesion of the coronary arteries was observed. The mere existence of atheroma will not explain the occurrence of angina, unless actual narrowing of the vessels be also present. The symptoms of this form present special characters. The paroxysm supervenes on difficult digestion or on movements made during digestion, but is never declared while the patient is in a state of repose. It is also accompanied by radiations of pain along one or both of the upper extremities, and especially the left.

2. The second form differs completely from the first, inasmuch as it is not connected with any lesion of the coronary arteries, but assumes the characteristics of a true neurosis. It is met with either in the subjects of rheumatism or in nervous persons; is of much less importance than the other form; and occurs oftener in private than in hospital practice. It comes on under the influence of cold or damp. Thus, a young woman, who, after having been heated in dancing, had exposed her uncovered neck to an open window, was seized during the night with a fearful paroxysm of sternal constriction, with irradiation of the pain down to her left hand, which, after lasting for some hours, disappeared, to recur nightly for more than a week. The paroxysms were then separated by longer intervals, until they entirely disappeared, leaving no trace behind. No cardiac or other appreciable lesion had preceded the attack. In this case the paroxysms did not arise under the influence of movements, but came on spontaneously during the night, "at what I may term the time of false croup." Moreover, their duration was longer, as they persisted one or two hours, and even sometimes longer; the patient in the intervals enjoying perfect health, being able to ascend or run with the greatest facility. On the other hand, in symptomatic angina, when the fit is off, the patient is still unable to ascend the slightest acclivity, while the paroxysm never comes on when he is in a state of repose, and scarcely lasts for some minutes. In this second, rheumatismal or nervous form, Prof. Potain has never met with a fatal case, so that the prognosis is entirely different. So is its etiology: for while symptomatic angina is especially met with in men of a certain age, and in gouty subjects, this second form particularly appears in young and nervous women.

3. In the third form, while the accidents are the same, the circumstances are quite different, the origin and true cause of the disease being generally found in an affection of the heart of old date. This is a dilatation of the organ, whether it be the result of chronic disease of the lungs (sclerosis, emphysema, etc.), primary gastric disturbance, or a pulmonary affection complicated with gastric disturbance. The patient is seized after a meal, and especially if this meal has been followed by rapid walking, with a deep-seated sense of anguish and oppression and suffocation, without true dyspnoea. The pain, which is sometimes substernal, is much oftener seated in the cardiac region itself (pain in the heart, as it is called), and is accompanied by a feeling of plenitude and not of constriction, and by a numbness which often irradiates along the left upper extremity. Although no statistics on the subject exist, this form would seem to be of more frequent occurrence than the second, and perhaps even than the first. While the prognosis, however, of the first is fatal, and that of the second is generally favourable, the symptoms of this third form are a mere epiphenomenon, which of itself does not constitute the true danger.

In the treatment of the first form of the affection there is, unfortunately, little to be done, especially during the paroxysm, the short duration of which hardly allows of intervention. If, however, it is at all prolonged, morphia injections may be useful. In the intervals, Prof. Potain has derived benefit from the iodide of

potassium, which exerts a favourable influence on chronic enteritis; and arsenic or the bromides may be recommended on account of their action on the nervous system. The second form requires quite a different treatment. During the paroxysms, external derivatives (blisters and sinapisms) and antispasmodics (camphor, assafœtida, and ether) should be resorted to; and in the intervals, vapour or sulphurous baths, tonics, chalybeates, country air, etc. In the third form, the treatment must vary according to whether the disease result from gastric disturbance or some pulmonary lesion. But, in any case, one of the most immediate indications is absolute repose—and that more absolute, perhaps, than in this first form, if a cure of the affection is to be sought for.—*Med. Times and Gazette*, Nov. 20, 1880.

Occurrence of Albuminuria in Healthy Men.

Professor J. W. RUBEK, of Helsingfors (*Deutsches Archiv für Klinische Medizin*, Band 76, Heft 3 and 4), reviews at length some of the principal contributions which have appeared during the last few years to the solution of the problem of the clinical significance of albuminuria. The observations of Leube, Ultzmann, Moxon, Dukes, and Saundby have established the frequent occurrence of albuminuria in persons who do not present any other signs of kidney disease. A few years ago, such cases of latent albuminuria were regarded as instances of granular kidney, but their frequency makes this improbable.

Bull has suggested that the albuminuria indicated a Bright's diathesis or tendency to Bright's disease, and Johnson has stated that such cases, if not cured, pass on to organic kidney-disease; but this can hardly be considered as finally settled. The transudation of albumen, according to Rubeck, depends upon an abnormal permeability of the walls of the glomeruli, and this permeability in its turn depends upon the blood-pressure. As he has shown, the filtration of albumen through animal membrane is increased by low pressure and diminished by high pressure, so that the old dogma, that the amount of albumen is directly proportional to the pressure on the glomeruli, must be abandoned or reversed. It is well established that active muscular movements increase albuminuria, but this is probably due to the lowering of blood-pressure in the glomeruli, a circumstance which is indicated by the diminished secretion of urine, and is supported by the physiological experiments of Ranke, which show that, owing to the large amount of blood flowing into the active muscles, the internal organs have their blood-pressure lowered. Moreover, Bartels pointed out that in renal cirrhosis the albuminuria is greater in the day than at night, which he attributed to the increased pressure due to muscular exertion. But the amount of urine which admittedly stands in direct relation to the blood-pressure, is greater during the night than during the day.

Rubeck gives three tables, showing that the quantity of urine was almost invariably greater during the night than during the day, while the contrary was of the albumen, both proportionally and absolutely. But Leube, Moxon, and Fürbringer have stated that the urine passed in the forenoon is more albuminous than that passed in the afternoon or at night; and Rubeck gives a table showing this to be the case, but that the urine secreted during the forenoon is less absolutely, and less per hour, than that passed at the other periods. These facts, he contends, support his doctrine that albuminuria depends upon lowering of the blood-pressure in the renal glomeruli.—*London Med. Record*, Nov. 15, 1880.

Periodical Hemoglobinuria.

Dr. OTTOMAR ROSENBAUM (*Berliner Klinische Wochenschrift*, 1880, Nos 10 and 11) relates the case of a boy, aged 7, who, after a fall from a wagon, be

came subject to attacks of periodical hæmoglobinuria. At first, these commenced with shivering, pallor, and yawning; then he complained of headache and fell asleep, and on waking passed dark urine and looked blue; his forehead was covered with sweat; only occasionally was there much sweating of the body. Afterwards, the shivering and other prodromata were not constant. The attacks were less frequent in winter than in summer, his parents attributing this to the fact that in winter he was kept in a warm room because of the cold; but in summer he ran about and played, and exposed himself to variations of temperature. There were no abnormal physical signs, except a feeble systolic murmur at the heart's apex. There was no pain over the kidneys; the urine, ordinarily, was quite normal; at the beginning of an attack, it first contained albumen, without hæmoglobin, then later on became dark-coloured, and contained hæmoglobin, or often methæmoglobin. At that time it was neutral or alkaline. The microscope showed hæmoglobin-granules and cylinders, with a very few red and white corpuscles and hyaline cylinders. The examination of the blood gave a perfectly negative result. The temperature at the commencement was normal, but rose during the attack to 30.5° Cent. (103° Fahr.). In order to test the etiological value of cold, his feet were placed in a cold foot-bath for three-quarters of an hour, when he passed urine slightly tinged with blood, and soon became alarmingly collapsed, and had a severe attack. Dr. Rosenbach thinks that these facts oppose the view that it is a general disease, as the general symptoms always occurred after the local phenomena were well developed. The examination of the blood gave no support to Ponfick's theory of a destruction of blood-corpuscles. It is hard to understand why albumen appeared first in the urine, without any hæmoglobin. He suggests that it is not impossible that blood-colouring matter may occur in the circulation, apart from the destruction of blood-corpuscles. Diuresis with strong coffee, which produced a copious flow of urine, and irregular pulse, was not accompanied by excretion of blood-colouring matter.—*London Med. Record*, Nov. 15, 1880.

Menstrual Erythema and Erysipelas.

Dr. PAULI reports (*Berliner Klinische Wochenschrift*, No. 45, 1880) an interesting case of the above kind occurring in the clinique of Professor Waldenburg. The patient was single, twenty-six years old, and had menstruated regularly until the autumn of 1877. Then she was operated on for hæmorrhoids, and the operation was followed by periproctitis and long-continued ulceration of the rectum. While the patient was suffering from these sequelæ, menstruation was absent. The disease just mentioned having been cured, on August 14th an erysipelatous-like redness appeared over the upper part of the left side of the face, which was swollen, and there was a slight tendency to the formation of bullæ; but there was no shivering, elevation of temperature, or other general symptoms such as accompany erysipelas. Three days afterwards menstruation began, and this redness went away, slight desquamation of the skin taking place. There was no similar affection of any other part of the body. The same thing preceded the catamenial flow in September and October. In November the appearances were much the same in kind, but more marked, and accompanied with rigors and fever. In December and January the same phenomena heralded the appearance of the menses. In February the patient insisted upon returning home, and therefore the termination of the case could not be watched. The author explains the erythema by supposing it due to a reflex stimulation of the vaso-motor nerves supplying the vessels of the part affected, and the erysipelas by assuming that this disease fastened itself upon the *locus minoris resistentiæ*—*Med. Times and Gazette*, Nov. 27, 1880.

Some Unusual Forms of Erythema due to Cubebs and Copaiba.

A case in which a peculiar form of rash followed the administration of the above-mentioned drugs is reported by M. MAURIAC in the *Annales de Dermatologie et de Syphiligraphie*, July, 1880. A man, aged 30, who had previously taken copaiba without any ill effects, was ordered a paste of copaiba and cubebs in an ordinary dose, for an attack of gonorrhœa. On the third day after beginning the medicine, itching and pricking sensations were felt about the neck, and next day there appeared a confluent eruption of a wine-red colour on the trunk and neck, accompanied by great œdema of the face. During the same day, the eruption extended to the limbs; the eyes became watery, and there was slight sore throat, but no constitutional derangement. On the third day of the eruption the pulse was 90; the tongue was red at the sides, and white in the middle; and there were large erythematous patches, mingled with smaller ones, on the trunk and upper limbs. The patches were a little raised above the surface, and had a mottled appearance. The ears were red and swollen. The whole face was dusky red, and the features were almost unrecognizable owing to the extreme degree of swelling. The eruption was uniformly distributed, and there was very little itching, and no nasal catarrh. Thirst was now complained of, and there was loss of appetite. Temperature 101° F. The paste had been discontinued at the outset of the eruption. The urethral discharge had almost disappeared. On the fourth day the temperature was 104.4° F., the eruption was less bright, and the swelling of the face was subsiding. Some of the patches, however, especially about the forearms and wrists, had become circular, each being composed of several concentric zones. The centre was red and ecchymotic, then came a pale rose-coloured zone, and outside this a deep red one. The patches were raised, and each was from two to three centimetres in diameter. On the lower extremities the ecchymotic tendency of the eruption was marked, and numerous small purpuric spots were present. Here also the patches showed a tendency to arrange themselves in zones, their punctation with an infinite number of dark points presenting a very striking appearance. The urine contained no albumen, and there was no feeling of malaise. On the sixth day of the eruption the œdema and redness of the face had disappeared, and the trunk was nearly free; but the rash still persisted on the lower extremities. The skin over the chin was desquamating. On the eighth day the eruption had almost disappeared, and desquamation was going on at the places where the rash had been most marked. About the twelfth day the patient was well, the temperature and pulse were normal, and there only remained a bluish-yellow mottling of the surface and a few purpuric dots on the lower limbs.—*Lond. Med. Record*, Nov. 15, 1880.

Treatment of Intertrigo in Children.

Dr. WERTHEIMER (*Annales de Dermatologie et de Syphiligraphie*, 2me serie, vol. i. No. 3) recommends, for the intertrigo of infants, cleansing with soap and tepid water; but, if the skin is excoriated, the use of bran-water instead of soap-water. The powder he prefers is a mixture of lycopodium powder and bismuth, or oxide of zinc. In excoriated cases, Hebra's diachylon ointment is preferable to powders. In serious cases he applies to the excoriated parts pieces of cloth, soaked in a 5 per cent. solution of corrosive sublimate. It is not necessary to allow the solution to remain long in contact with the skin, an hour three or four times daily being sometimes sufficient.—*Lond. Med Record*, Nov. 15, 1880.

Unilateral Pemphigus.

Professor PICK (*Wiener Med. Presse*, No. 21, 1880) describes a case in which, in a hysterical woman, aged twenty-four, the whole of the right side, from the face to the ankle, was covered irregularly with variously sized blebs. The bullæ were first confined to the right side of the face and neck, and the affection was considered to be herpes zoster; but later the disease extended down the right side to the ankle, and followed the course of ordinary pemphigus. The eruption was preceded by local burning and redness, and by general febrile symptoms.—*Lond. Med. Record*, Nov. 15, 1880.

SURGERY.*Modifications and Improvements in the Bloodless Method of performing Surgical Operations.*

Professor ESMARCH at the Congress of Surgeons in Berlin (*Archiv fur Klin. Chir.*, vol. 25, p. 261), observed that it was now seven years since he brought under the notice of his colleagues his method of performing operations under the influence of artificial ischæmia. Since that time, the greater number of surgeons had tried this operative method, and there was reason to believe that some eminent and experienced persons who had employed it had abandoned it, wholly or in part, because they found that, after taking off the constricting band, the parenchymatous or secondary bleeding had been as abundant as with the old methods.

Esmarch regarded this as a fact to be regretted, for patients as well as for surgeons, since no one could deny the considerable advantages which ischæmia afforded during surgical proceedings. He asserted that the want of success attributed to ischæmia depended only upon the defective mode of employing it, and that the modifications which had been suggested on various sides were not of a character to reduce the number of failures. He had for several years continued to study the methods of obtaining bloodlessness during operations in his hospital practice, and of late years had succeeded in performing a great number of operations on the limbs without loss of blood in the strictest sense of the word.

He described his present mode of operating in three varieties of great operations performed on the limbs, in amputation, in resection, and in extraction of sequestra. In amputation, his rule was that, after performing the operation without loss of blood, he carefully tied all the vessels that were visible, but he did not immediately remove the constricting tube. He at once united the edges of the wound by the deep suture of Peltier, using catgut sutures. At the dependent part of the wound he placed a short drainage-tube of material capable of absorption, and in cases of need caused it to emerge through an opening made in the skin. Finally, retentive dressing was then applied, and the limb was placed in a vertical position; then only was the compressing tube removed. The patient was carried to his bed, and so placed that, for half an hour afterwards, the stump remained directed upwards, and only at the end of that time was it laid horizontally.

He had recently performed in this way twelve amputations—one of the forearm, one of the arm, nine of the leg, and a partial amputation of the foot; by Lisfranc's method. In none of these cases did any consecutive hemorrhage occur; so much so that the dressing was left intact up to the fourteenth day, when it was removed. There was found only a narrow red streak stained with dry blood, corresponding to the cicatricial line.

In resections, he had, from 1873 to 1875, applied the dressing before the removal of the constricting tube, but he had observed secondary hemorrhages in consequence of insufficient compression; and he therefore abandoned this proceeding. From 1875 to 1878 he removed the tube before dressing, and performed the dressing only after having arrested all flow of blood. For the last two years, after having improved the mode of dressing, he had again endeavoured to apply the dressing before removing the constricting tube, and he now proceeded in the following manner. After the operation, he tied the vessels which could be discovered. The edges of the wound were united by Peltier's suture, performed deeply with catgut, drains of absorbent material were introduced into the wound in a proper manner, and the final compressing bandage was applied. The whole limb was placed vertically, and the constricting tube was then removed. The limb in this position was secured on a splint with the aid of a bandage, and the patient was carried back in this position to bed; and not until half an hour afterwards was the limb placed in a more horizontal position.

Since 1878 he had performed in this way fifty-six resections of the knee, the elbow, the tibio-tarsal articulation, and the radio-carpal articulation. In no case had secondary hemorrhage or death occurred. In thirty-three cases, the dressing was left in place for three or four weeks; the progress of the wound was absolutely antiseptic. In cases of gouging, or of extraction of sequestra, the dressing was performed in the manner indicated by Esmarch some years ago; that is to say, the excavations of the bones were solidly plugged at first with carbolized cotton, and the end covered with salicylic acid dressing, and the whole firmly bandaged before removing the constricting tube. In 148 cases operated upon in this manner, secondary hemorrhage followed, which passed through the dressing and made it necessary to renew it. In some cases, the compression of the bandage produced sloughing of the skin. In spite of these accidents, healing took place by granulation without abundant suppuration, but somewhat slowly. After disinfection of the cavity of the bone, carefully made with a solution of carbolic acid and chloride of zinc, the edges were brought firmly together by a catgut suture, absorbent drainage-tubes were employed, and the tube was not taken off until after the completion of the dressing.

This method had been applied twelve times, and always with success. In no case did the escape of blood occur to such an extent as to make it necessary to renew the dressing. The wounds remained antiseptic. In the cure obtained by the first intention, the blood-clot, which fitted the whole osseous excavation, became organized in the way often described by Lister, and with enormous advantage to the patient—in reference especially to the rapidity of cure. The same dressing was applied in the same manner in other operations of extirpation of tumours, stretching of nerves, etc.; and Esmarch believed that this mode of procedure might ultimately be applied by amputation of the thigh and exarticulation of the hip and shoulders.—*Lond. Med. Record*, Nov. 15, 1880.

A Case of Extirpation of the Larynx.

THE following case of extirpation of the larynx was performed by M. CASELLI, and is recorded by Professor Pironi in the *Marseille Médical*, 20th April, 1880.

The patient, a girl, aged 19, had a year before, first felt a difficulty in swallowing, which became gradually so much worse, and was attended by such prolonged fits of suffocation, that she entered the hospital at Reggio. A large epithelioma was found extending from the larynx to the pharynx, soft palate, tonsils, and base of the tongue, and was already ulcerated. Two-thirds of the epiglottis were involved, and the glottis was so surrounded by the growth that

even a very small bougie could not be passed. It was decided to extirpate the larynx. The patient being brought under chloroform, an incision was made with the galvano-cautery in the middle line of the neck, from the third to the fifth ring of the trachea, which was next perforated, and a Trendelenburg's tampon-canula introduced.

The patient was now placed so that the head hung down over the table, and was supported by a cushion placed upon the knees of the operator. A fresh incision (also with the galvano-cautery) was then made, extending from the superior angle of the tracheal opening to the lower jaw. The wound was widened by inserting the forefinger into it, and the sterno-hyoid muscles, which M. Caselli wished to preserve, in order that they might later serve to keep the hyoid bone in its normal position, were separated by hooks. The thyroid gland, and a portion of the perichondrium, were next detached from the front of the thyroid cartilage by means of a retractor.

After having freed the whole of the larynx from the neighbouring tissues, by passing the galvano-cautery around it, M. Caselli cut the lateral and median thyro-hyoid ligaments, with all that united the thyroid cartilage to the hyoid bone. The thyroid gland having been raised, and separated, partly by the bistoury, and partly by the galvano-cautery, from the cricoid cartilage, the latter was severed from the trachea by an horizontal incision, made at a level of the first interannular tracheal space, the trachea being first secured by two threads to prevent it from slipping behind the sternum.

To procure more room the hyoid bone was next divided in the middle line, and the genio-hyoid muscles were separated from each other. The pharynx was now freed from the growth posteriorly and laterally, and the œsophagus, having been first secured by threads, was divided with the galvano-cautery opposite the fifth cervical vertebra. The base of the tongue and epiglottis were next removed, and then the soft palate, fauces, and tonsils.

The operation lasted three hours and ten minutes. The two halves of the hyoid bone were reunited by catgut, the vast wound was washed out with carbolic acid lotion, and, having been well sprayed, its edges were brought together with eight sutures. A tracheal canula and an œsophagus bougie were placed in the trachea and œsophagus, and held in the position in the usual way. The eschars separated in due course, and by the sixth day the trachea and œsophagus had already contracted firm adhesions. On the fifteenth day the œsophagus tube was passed through the mouth, and the patient was allowed to get out of bed for two hours. From this time she rapidly progressed towards recovery. The œsophageal dilator was passed every night and allowed to remain in the œsophagus, secured by a string to the ear, till the morning. An artificial larynx was ultimately constructed for her, and was used with success, and worn with comfort.—*London Med. Record*, Nov. 15, 1880.

Laryngeal Stenosis after Typhoid Fever.

M. KOCH remarks (*Annales des Maladies de l'Oreille, du Larynx, etc.*) that in the literature of the subject only those alarming symptoms of laryngo-typhus are mentioned which call for tracheotomy. We read that the patients either died during or immediately after the operation, or that they were obliged to wear a canula for the rest of their lives. Nowhere is the condition of the patients during the years which follow the operation described, as, in nearly all the cases recorded, they appear to have been lost sight of soon after the performance of tracheotomy, and the slow progress of the cartilaginous affection for this reason seems to have escaped notice.

M. Koch contributes the following case as bearing upon these points. A healthy countryman, aged 22, was attacked with a severe form of typhoid fever. Laryngeal symptoms developed themselves during the seventh week, and, fifteen days afterwards, the fits of suffocation threatening life, tracheotomy was performed. During the operation, it was noticed that there was an abscess involving the cricoid cartilage and the tissues of the neck around. This was avoided by performing the low operation, which had, however, been previously decided upon, on account of the fatal results which had hitherto attended the performance of laryngotomy in laryngo-typhus. After the operation the patient breathed naturally, but examination revealed such a degree of laryngeal stenosis as to make it appear probable that the canula could never be dispensed with. During the two years that followed, however, respiration became daily easier, but purulent expectoration persisted, although no secondary abscess had formed. At the end of that time the canula was taken away, and the laryngoscope revealed a condition of the larynx similar to that of a simple, though intense, laryngeal catarrh. At the present time the man is in perfect health, and works and exposes himself to all temperatures.

From this case, it is seen that laryngo-typhus is not so short as the sudden appearance of the first symptoms and the classical descriptions of the affection would lead us to suppose. On the contrary, after the acute stage has passed, the malady assumes a chronic character, like that of diseases of cartilage in general. Such forms of perilaryngitis are of extreme slowness; they may end by a secondary abscess opening cutaneously, with or without elimination of portions of the cartilage, or by the expectoration of pus and cartilaginous *débris* by the mouth.—*London Med. Record*, November 15, 1880.

Thermo-Cautery in Tracheotomy.

M. BÆCKEL has performed twenty-two cases of tracheotomy during the last two years, by means of the thermo-cautery, and now publishes the statistics of these cases in the *Annales des Maladies de l'Oreille, du Larynx, etc.*, for June, 1880. Among these cases there were thirteen recoveries, and nine deaths. In nearly all of them, the isthmus of the thyroid body was divided without loss of blood. The possibility of thus dividing the isthmus of the thyroid without hemorrhage facilitates, M. Bæckel thinks, in a great degree the operation of tracheotomy, as the trachea at this level is superficial, and can be opened with the greatest safety, when once the isthmus is divided, for the subthyroidean venous plexus need not then be taken into consideration. In the thirteen cases of recovery, not a single one was complicated with secondary hemorrhage. The incision into the trachea was mostly made with the bistoury; but in four cases hemorrhage resulted, and caused M. Bæckel so much alarm that in two patients, in whom the neck was much congested, he divided the trachea with the thermo-cautery to prevent a like occurrence, and not the least inconvenience resulted from it. M. Bæckel goes on to say that stenosis of the trachea following cicatricial contractions after the use of the thermo-cautery must be taken as purely hypothetical. The thirteen patients who recovered have frequently been seen by him; and not in any one of them was there the least symptom which would suggest a narrowing of the trachea.—*London Med. Record*, November 15, 1880.

Tracheotomy in Infants.

It is well known that tracheotomy, for whatever reason it be undertaken, is always more fatal in early infancy than in more advanced years. One of the youngest of the successful cases on record is interesting, not only on account of

the age, but also because the operator was the father of the little patient. We refer to the well-known case in which M. Scoutetten, of Strasburg, in 1830, successfully operated on his own infant, aged six weeks. Some doubts have been expressed as to the nature of the disease which called for the operation. We will not stay to discuss the matter; contenting ourselves with the moral, that there is nothing in the operation itself incompatible with recovery even at the age of six weeks. Since this date some other cases of early tracheotomy have been recorded: Mr. Joseph Bell, of Edinburgh, reported a successful case at six months and a half; Mr. Tait at seven months; Dr. Greenfield, at ten months; Mr. Cooper Forster, at eleven months. There are doubtless many other cases, if we could collect them, of successful operation in very young subjects; the recollection of them will help to reconcile those who have hitherto abstained from operating simply on the ground of youth.

Another successful case in a very young infant (aged nine weeks) is recorded in the *Berliner Klinische Wochenschrift*, No. 40, 1880. Dr. H. STEINMEYER, of Brunswick, was sent for to see an infant who was said "to be ill with diphtheria and choking." The child came of a phthisical mother. It was normally developed, and during the first four weeks of its life had always been quite healthy. In the fifth week it had had abscesses near the anus, and others on the palms of its hands. The infant wasted considerably during this time. In the eighth week a cough had come on, and it daily became worse and emaciated, and difficulty in breathing set in. This latter symptom persisted, and on its becoming very urgent Dr. Steinmeyer was sent for.

When first seen, the usual symptoms of laryngeal stenosis were very manifest—viz., cyanosis, with drawing down of the facial muscles during inspiration, which was loud and hoarse; expiration was short and inaudible. There was great retraction in the epigastric region. Nothing abnormal, beyond oedum albicans, could be detected in the mouth or pharynx. The epiglottis, when examined by the finger, did not appear to be sufficiently swollen to be the cause of the obstruction. A laryngoscopic examination could not be satisfactorily made. On the exterior surface of the neck, over the right thyroid cartilage, and in size corresponding with it, a very slight swelling was detected; it was only appreciable to the eye by carefully comparing the two sides; it did not fluctuate. The temperature was 103° F. (39.5° C.), and the pulse could not be counted. Tracheotomy was decided upon. But the exact cause of this obstruction could not be made out, although an abscess in the neighbourhood of the larynx was suspected.

The operation was a very difficult one, and lasted an hour. The trachea was no larger than a goosequill; it was displaced considerably to the left of the median line. An anæsthetic does not appear to have been used; the operator, "on account of the infant's restlessness," found great difficulty in introducing the canula. The respiratory trouble ceased immediately on opening the trachea; all cyanosis quickly disappeared, and the infant rapidly recovered. It could not, however, take the breast on account of coughing. It rested well all the next night. Four days after the operation, the temperature still being 103° F., the child became very restless. The swelling over the thyroid cartilage was more manifest, and the superimposed skin somewhat reddened. An incision into it through the tracheal wound let out pus, and on enlarging the opening on a director a very considerable amount of pus was evacuated. The cough continued troublesome; attempts to remove the canula were unsuccessful. The temperature was normal. After the tenth day, the child, which up to this time had continued to improve, began to get worse; its food (milk) regurgitated through the nose. There was nothing appreciable to account for this unfavourable change. On the thirteenth day after the operation, however, suddenly, and while the child was

trying to scream, a quantity of fetid pus was discharged through the mouth, while some more issued from the tracheal wound. Very shortly after this the child began to cry audibly. The canula was removed on the following day, and complete recovery was very soon established. It will be obvious that the case was one of retro-pharyngeal abscess. The diagnosis is often quite impossible, and, under the circumstances, tracheotomy appears to have been the only resource.—*Med. Times and Gazette*, Nov. 20, 1880.

Cases of Extirpation of the Kidney.

Dr. W. H. BYFORD, of Chicago, at the late meeting of the American Gynecological Society (*Boston Med. and Surg. Journal*, Sept. 23, 1880) reported the case of a female, aged 39, from whom he had successfully extirpated the right kidney on account of encephaloid disease on March 14th. He thrust a small trocar into the abdominal wall in the median line, midway between the umbilicus and the symphysis pubis, and about a pint of thin, yellow, serous fluid, devoid of viscosity, was drawn off. Believing this to be peritoneal serum, the trocar was withdrawn, and an incision made at the same place, about an inch and a half in length, entirely through the abdominal wall. Through this opening sixteen or eighteen pounds of serum were evacuated. The abdominal wall collapsed about the tumour, and rendered it easily accessible by the fingers. It was attached to the right posterior portion of the abdomen by a thin, broad band, partially divided into two parts, and it could be moved about with considerable facility. Its surface was nodular and impressible, but there was no fluctuation. It was oval in shape, and appeared to be about eight by six inches. From this exploration, I could not doubt that it was an enlarged and diseased kidney, and I determined to remove it. By extending the incision to about seven inches in length, and pressing the abdominal walls back around it, the tumour was expelled from the cavity, revealing two broad peritoneal folds, strengthened by connective tissue, extending over its sides from the back. These were tied in three parts by double silk ligatures and cut through with scissors, and the tumour liberated. The serum, still in considerable quantities, was absorbed by fine carbolized sponges, and removed. This seemed to clean the peritoneal cavity thoroughly as it was taken out, and left everything as clean as possible. After examining the pedicle, to be assured that the vessels were secure, the ligature was cut short, and the whole dropped into what was plainly the bed of the kidney. The wound was closed with silk sutures, and dressed according to Lister's method. The whole operation was, of course, done under the carbolized spray. The tumour weighed four and a half pounds.

The patient made a good recovery, and was discharged from the hospital on the 26th of April, 1878, in good spirits and improving health. "In four or five months," Dr. Byford says, "she had become fleshy and ruddy in appearance; and the last time I saw her, on the 1st of July, 1880, she had the appearance of perfect health. I could detect nothing abnormal in the contents of the abdomen or pelvis, and the urine was normal in composition. The impoverished condition of the system made support the main object of the treatment, and as the stomach was uniformly tolerant after the operation, the patient took a liberal quantity of nourishing food. The medicines were quinine, iron, and opium. Occasionally the acetate of potash was given, with a view to promote the urinary secretion.

Mr. JOHN COUPER, Surgeon to the London Hospital, reports (*Med. Times and Gazette*, November 20, 1880) the case of a girl whose right kidney had become converted into a large cyst filled with pus. The chief interest in this case

arose from the certainty with which the symptoms pointed to morbid changes in that kidney as the source of the patient's illness.

The illness began in 1879 with pain in the right loin. She lost flesh, became weak, and the urine was always turbid when passed. Micturition was never more frequent than in health, nor was there pain over the bladder. She could not lie on the right side without discomfort. There were no acuter symptoms excepting in November, 1879, when she was confined to bed for several weeks. Last April she was seen by Dr. Warner at the Radcliffe Hospital, who, finding a tumour in the loin, advised her removal to the London Hospital, where she became Dr. Barlow's patient on April 17. The abdomen was not over-distended. A more or less solid mass occupied the right iliac and lumbar regions. There was slight visible fulness to the right of and below the umbilicus, but no marked swelling. The liver-dulness commenced at the lower border of the sixth rib in front, and extended nearly to the crest of the ilium. On grasping the loins posteriorly there was pain on the right side only. The inguinal glands were not enlarged. There was slight pitting of the legs anteriorly on pressure. Urine was passed from three to four times daily, and contained one-third of its volume of pus.

By an examination under ether it was found that the ascending colon lay in front of the tumour, that deep-seated fluctuation was present in the latter, that its inner edge reached the middle line, its lower edge to one inch above Poupart's ligament, and its upper edge three-quarters of an inch below the margin of the ribs. The tumour did not extend into the pelvis, was movable, and could be tilted from hand to hand. It did not change position on deep inspiration, and was not connected with the liver. There were no symptoms of cystitis; urine was acid. Vagina and uterus were found healthy by Dr. Herman. The tumour was obviously the right kidney distended with pus. The chronic character of the symptoms, the absence of any tendency to point, and the presence of pus in a healthy bladder, were all against the diagnosis of perinephritic abscess.

The question of relieving the patient was next considered. Dr. Barlow and Mr. Couper agreed that the pus should be drawn off by an incision into the tumour from the right loin, and that the question of nephrectomy should be left open till the kidney could be examined by the finger passed into the wound. As regards the prospect of successful nephrectomy, evidence as to the condition of the other kidney was of vital importance, and here Dr. Barlow pointed out—first, that there had been no vomiting, so often a distressing symptom where both kidneys are diseased; secondly, that the urine was normal both as to quantity and the percentage of solids contained in it, thus proving that there was no renal insufficiency; thirdly, that the amount of albumen present was very small; and lastly, that the size of the tumour was incompatible with the persistence of any trace of normal secreting structure. The morning temperature was generally normal, and it rarely rose to 102° in the evening. The thoracic organs were healthy. All these conditions constituted a case exceptionally favourable for nephrectomy, should that operation prove to be necessary.

On April 24, the exploratory incision in the right loin was made with the customary precautions against sepsis, the patient being etherized. The section was horizontal, and precisely in the position of that practised in lumbar colotomy. After division of the fascia lumborum, a smooth, fluctuating swelling was exposed on the outer border of the quadratus. A trocar plunged into this gave vent to a dark-coloured, foul smelling pus in large quantity. Enlarging the opening thus made, and removing the trocar, Mr. Couper passed his forefinger into a loculated sac, obviously the disorganized and dilated kidney. Now arose the question, should this sac simply be drained, and allowed to close by granulation, or should it be dissected out? The branching form of the cavity, its enormous extent, and

the thick resistant condition of its walls, must have rendered closure by granulation tedious and uncertain. The removal of the kidney was accordingly undertaken. The adhesions of the peritoneum in front were very close, and its separation from the tumour was effected without a hole being made into the peritoneal cavity. Before this hole could be closed by suture, pus from the kidney contaminated the inner surface of the perineum. The ureter was soon reached, tied with strong catgut, and divided. An artery of moderate size below the hilum was ligatured and divided. The main vessels were tied *en masse* with carbolized silk, and divided. The tumour was then quickly detached from its peritoneal connections below the liver, and removed.

The operation lasted two hours and a quarter, and was throughout all but bloodless. Recovery was uninterrupted. The temperature never reached 102°, and on only three occasions did it exceed 101°. In spite of the fetid character of the pus, the wound did not become septic, and all foul smell was gone in twenty-four hours. For some days after the operation the urine was clouded, and microscopic traces of pus continued to be found in it. These finally disappeared during the third week. The girl left her bed on the thirty-sixth day, and was discharged on August 8. There is still a granulation at the posterior end of the cicatrix, but the girl is rosy and in good health.

A preparation of the parts removed at the operation was shown. In addition to the altered kidney—(1) the stump of the ureter, nearly unaltered; (2) the ends of three arteries not larger than the radial—one joined the kidney below the hilum, the remaining two were embedded in a dense connective-tissue mass at the hilum, and were evidently all that remained of the renal artery, which as suggested by Mr. Moulin, had undergone atrophy in proportion to the degeneration of the secreting structure of the kidney.

M. L. LE FORT, at a meeting of the Académie de Médecine (*Progrès Médical*, Nov. 13, 1880), read a paper on Extirpation of the Kidney for Fistula of the Ureter. He rejects nephrectomy in cases of cancer of the kidney, and especially in cases of floating kidney, and asks the question: Can we, and ought we, to attempt it in cases of fistula of the ureter? M. Le Fort persists in believing that we ought, in spite of his want of success, particularly when there exists, as in his case, a primary fistula near the kidney opening into an abscess, the suppuration of which is kept up by the incessant trickling of urine, and which, of itself, placed the life of the patient in imminent danger. Simon's success shows that this operation may be followed by cure. In these cases the operation can only be performed through the lumbar region, and if the extirpation of the healthy kidney is only attended by easily surmounted difficulties, these difficulties become considerable when there has been inflammation, and even suppuration of the cellular tissue surrounding the kidney. Enucleation of the organ would, in such cases, greatly facilitate the operation. Combaré, in his experiments on dogs, set down in his thesis of 1803, remarked the frequency and obstinacy of the vomitings after removal of the kidneys, and it was after incessant vomitings that M. Le Fort's patient died, a quarter of an hour after the operation.

Excision of Cancer of the Rectum.

Dr. CHARLES B. KELSEY, of New York, draws the following conclusions from a study of one hundred and forty cases of excision of cancer of rectum.

1. The fatal results which have thus far been recorded as following this operation nearly all occurred in cases where from the extent of the disease such a result was not improbable.

2. When the disease reaches above three inches, or involves neighbouring parts

to such an extent as to render its entire removal without injury to the peritoneum questionable, the operation is contra-indicated.

3. Although there have been a few cases of cure, such a result is so rare as not to justify the exposure of the patient to the risk of immediate death which attends the attempt to remove extensive cancerous disease.

4. The operation is chiefly valuable as a palliative measure, and as such it is applicable to cases where the disease has not made extensive progress.

5. As a palliative measure in proper cases, it compares favourably with the results of lumbar colotomy, both in prolonging life and in relieving pain.

6. The operation is not followed by an annoying incontinence of feces, except in a small proportion of cases.

7. The operation is not a substitute for lumbar colotomy in cases where the disease has reached more than three inches from the anus.

8. There is no proof that the operative interference shortens life by hastening the progress of the disease.—*New York Med. Journal*, Dec. 1880.

Prophylactic Value of Excision of the Initial Syphilitic Sclerosis.

Dr. CHADZYNSKI, of Lemberg, discusses (*Annales de Dermatologie et de Syphiligraphie*, July, 1880) this question by the light of the experiments of Pick, Unna, Auspitz, Kolliker, Sigmund and others, and tabulates thirty cases in which he himself excised indurated sores. The mode of operating was as follows: The part was first washed with a solution of carbolic acid (3 or 4 per cent.). The induration was next laid hold of with the fingers or forceps, and, under the spray, the whole indurated portion was removed. Sutures were then inserted according to the size of the wound, and carbolic lotion, or iodoform applied. In only six of the thirty cases did primary union take place. In five, induration reappeared, but the cicatrix sometimes remained free from hardness, even after the appearance of secondary symptoms. Seven cases were successful, sixteen were unsuccessful, and, in the remaining seven, the result was unknown, owing to the disappearance of the patients. Of the successful cases (those in which there were no signs of constitutional syphilis), two were kept under observation for six months, three for seven months, one for thirteen months, and one for more than twenty-four months. In all the seven there was more or less enlargement of the corresponding lymphatic glands at the time of the excision of the sore.—*London Med. Record*, November 15, 1880.

OPHTHALMOLOGY AND OTOTOLOGY.

On the Cause of the Tendency to Progression in Myopia.

JAVAL (*Annales d'Oculistique*, Aug. 1880) considers it important for myopic eyes to avoid as much as possible any effort at accommodation. In slight degrees of myopia, *i. e.*, under three to five dioptries, he gives convex glasses for reading; when the myopia is greater, concave, which bring the far point to thirty centimetres or thereabout. This treatment which he has adopted for many years, has, he considers, been highly effectual in preventing the myopia increasing. He does not accept the view of Donders and Giraud-Teulon that convergence tends to increase myopia owing to the pressure of the internal recti. Another explanation

seems necessary. Taking into consideration the extreme frequency of myopia in persons who read a great deal, and its rarity amongst needlewomen, who are obliged to keep up quite a constant convergence, the principal peculiarity in reading would appear to be the variations in the amount of accommodation which are necessary. Thus the difference in accommodation for the middle and ends of a line increases as the page is held closer to the eyes, so that, to take an extreme example, for a myopia of fifteen dioptries a line ten centimetres in length would demand a variation of accommodation equal to seven dioptries. No mention is made of the invariable compensatory movements of the head in such cases.—*Edinburgh Med. Journal*, Nov. 1880.

Hysterical Blindness with Spasmodic Squint.

Dr. W. MANZ describes the following case in the *Centralblatt für prakt. Augenheilkunde* for May, 1880. A nervous young lady, of weak constitution, was suddenly attacked, while the subject of headache, with convergent strabismus, especially of the right eye. At the same time, a high degree of amblyopia set in, along with concentric narrowing of the field of vision and spasm of accommodation. Ophthalmoscopic examination revealed nothing beyond a doubtful anomaly of formation, probably due to nerve-fibres with a double contour. The patient had almost completely recovered from the condition above described at the end of eight weeks; while it lasted, clonic convulsions occurred several times. A short time after the patient had been dismissed, a relapse occurred, in which, in addition to the previous symptoms, there was transient anæsthesia of the first and second divisions of the fifth nerve. The relapse disappeared at the end of three weeks, and was after a few days succeeded by a third, which lasted four weeks, and left slight impairment of visual acuity with asthenopic troubles.—*British Med. Journal*, Oct. 30, 1880.

Treatment of Polypi of the Ear.

Prof. POLITZER, in a communication to the *Wiener Med. Woch.* (1880, No. 31), refers to former papers of his in which he had shown how difficult and unsatisfactory is the treatment of polypi of the ear and their remains or granulations when situated in parts of the cavity of the tympanum which are difficult of access. The uncertainty of reaching them at all, the want of precision in the applications that are made, and the inefficiency of many of the means employed, cause the treatment by means of instrumental procedures, the application of various stimulating and caustic substances, or the employment of galvanism, very frequently to fail, even in the hands of the specialist. For the general practitioner, unaccustomed to manipulations which, to be successful, require much practice, and for whom the management of complicated apparatus is difficult, success will, of course, be of still rarer occurrence.

In the present communication he announces that he has now to state that the general practitioner will find in the employment of *spiritus vini rectificatus* a means by the aid of which he can far more successfully treat polypous growths and granulations than by any of the other means just adverted to. This substance was recommended by Hassenstein for the destruction of vegetable parasites of the meatus, and Prof. Politzer has also found it the best means for the treatment of *otitis mycosa*. It has been likewise recommended in chronic otorrhœa from abnormal conditions of the mucous membrane of the middle ear; but it is of inferior efficacy to boracic acid and nitrate of silver, and requires perseverance

in its use for several weeks. Its effects are far more remarkable in otorrhœa when there are present polypous growths or granulations in the meatus or in the cavity or membrane of the tympanum. Before employing it, it is essential to force out the purulent secretion from the cavity of the tympanum by means of air forced in by the Politzer apparatus and by syringing with tepid water; and any fluid remaining in the meatus is to be removed by means of a small roll of wadding. The head being held on one side, the alcohol, moderately warmed, is then to be poured into the ear by means of a teaspoon, and allowed to remain from ten to fifteen minutes. In most cases this causes only a gentle sense of warmth, and a burning sensation or severe pain is rarely produced, usually lasting only for a short time, and for the first few days. Where it is severe, however, the alcohol should be diluted with equal parts of distilled water. The application of the alcohol must at first be repeated three times a day, but after some time, when the growths have undergone considerable shrinking, twice a day, and at last once a day, will suffice. The immediate effect of the alcohol is to convert the red colour of the growths into a pale grayish-red, owing to the mucus and albumen on their surface having undergone coagulation. A longer contact of the alcohol leads to the penetration of the outer layers, the contents of the blood-vessels coagulating, and the shrinking of the growths commencing. The action of the alcohol is not, however, depending on the structure of the growth; for, although the soft, round-celled polypi disappear, upon the whole, more quickly than the dense fibromas, yet these also, after a more prolonged action of the alcohol, frequently so completely shrivel up that not the slightest trace of them remains.

Prof. Politzer cites some cases in proof of the great efficacy of the alcohol as a means, not only of removing these growths, but also of preventing their re-appearance after various caustic solutions have been used in vain for this purpose. It has proved of remarkable service also in several cases of diffused growths from the mucous membrane of the middle ear, which, in the form of fungoid granulations, have protruded excessively through the perforated membrana tympani. These cases are of a most obstinate character, and although the alcohol treatment succeeds, it has to be continued for weeks or months. Granulations or polypoid growths from the membrane are also satisfactorily treated, but the time required is very variable. Although in several of the cases referred to by Prof. Politzer the cure by alcohol was speedy, he cautions us not to expect this in the majority of cases in which the treatment has to be continued during several weeks, or even months, before the growth is entirely got rid of. If, after several weeks' trial, no diminution of the growth is observed, the alcohol should not be persevered with. Prof. Politzer has found it, in more than one-half the cases he has tried it in, the most preferable means for the removal of the remains of polypi and granulations, sometimes also rendering operative procedures unnecessary. The preference of this to the so-called medicinal solutions arises especially from the fact that the alcohol does not form with the secretions any insoluble precipitates, and is therefore followed by none of the ill consequences which these produce. One of its chief recommendations is that any practitioner is capable of applying it.

The indications for the employment of alcohol may be summed up—1. For the removal of the remains of polypi from the meatus, the membrana tympani, and especially the cavity of the tympanum, in cases in which these are not removable by operative procedures. 2. In multiple granulations of the meatus or membrana. 3. In diffused and excessive growths from the mucous membrane of the cavity of the tympanum. 4. In cases in which, on account of some mechanical obstacle in the meatus, the removal of the polypus cannot be accom-

plished by instruments. 5. In timid persons and children, in whom operative procedures meet with great obstacles, and often can only be executed under anæsthetics.—*Med. Times and Gaz.*, Nov. 6, 1880.

MIDWIFERY AND GYNÆCOLOGY.

The Management of the Third Stage of Labour.

Dr. MAX RUNGE, in a communication to the Obstetrical Society of Berlin, criticizes the current teaching regarding the management of the third stage of labour. He takes as the especial text of his animadversions the directions given by Fritsch, which are to the effect that *immediately* after the birth of the child the uterus is to be seized by the hand on the abdomen, and the placenta pressed out. Dr. Runge states that for a long time he faithfully carried out this method; and so did others in Professor Gusserow's clinique. The objection to it is, that the squeezing out of the placenta is begun before that organ has become completely separated; consequently, when the placenta has been expelled, often a bit of the membranes may yet be attached to the uterus, and be left behind after the placenta has been taken away. While this teaching was carried out it was quite a common thing for a pair of forceps to be needed to remove these retained pieces of membrane; and secondary post-partum hemorrhage became extraordinarily frequent. He refers to a former communication of his own, in which, treating of post-partum hemorrhage, he expressed his surprise that within a short time he had had many cases of this complication. Then he supposed this frequency was fortuitous. Now he knew the reason, which was his undue haste in pressing out the placenta. Midwives are now instructed, after the birth of the child (and having, of course seen that the uterus is sufficiently contracted upon the placenta to prevent hemorrhage), to wash and dress the infant before proceeding to press out the placenta. The separation of the placenta and membranes, Dr. Runge holds, is not complete until, upon an average, about a quarter of an hour after the birth of the child; and therefore about this length of time should be allowed to elapse before the placenta is pressed out. Since instructions based upon this principle have been given to the students and midwives of the Strasburg Obstetric Clinique, post-partum hemorrhage has become of very infrequent occurrence.—*Med. Times and Gaz.*, Nov. 20, 1880.

Incomplete Internal Spontaneous Rupture of the Uterus.

Dr. OTTO ALBERTS, of Berlin, publishes a case (*Berliner Klinische Wochenschrift*, No. 45, 1880) in which the above diagnosis was made. He saw the patient first after she had been in labour about seven hours. The pelvis was slightly contracted (conjugate between ten and eleven centimetres); the pains vigorous and frequent, but not producing much effect. He advised expectant treatment. Two hours later he was again called, and learned that the pains had suddenly ceased, and that the head had slightly receded. He found the belly very tender, the contour of the uterus indistinct and its consistence soft; and the fœtal limbs felt with extraordinary distinctness. There were no pains; the cervix uteri hung soft and loose in the vagina, and the head was high and movable above the pelvic brim. But the signs of deep collapse which usually accompany com-

plete rupture of the uterus were here absent. Immediate delivery was decided upon. Podalic version was performed, and the delivery of the head accelerated by perforation. The placenta followed spontaneously; the uterus contracted well, and there was no post-partum hemorrhage. Ergot was given. In the course of the day a tumour became perceptible in the right side of the hypogastric region, of the size of the fist, smooth, and circumscribed; this was believed to be a sub-peritoneal hæmatoma. This at first increased, and extended down into the right labium majus. When by manipulation the uterus was made to contract, this tumour was also felt to get hard. Seven weeks after delivery the patient went out, well. On account of the pelvic contraction, she was advised, in the event of a subsequent pregnancy, to have labour brought on prematurely. She became pregnant again, but neglected the advice given. Labour came on at term, and complete rupture of the uterus took place, the anterior wall being torn across, so as to separate the body from the neck of the uterus. The author considers that this rent must have begun in the cicatrix of the one believed to have formerly taken place.—*Med. Times and Gazette*, Nov. 27, 1880.

Porro Operation.

Professor G. VEIT records (*Zeitschr. f. Geb. u. Gynak.*, v. 2, 1880) a case of Porro's operation which ended fatally, although death was not due to the operation itself. Facial erysipelas supervened on the third day, the patient having done well up to that time, and death took place within twenty-four hours. A small abscess was found in each kidney. In this case the operative procedure was somewhat modified, in accordance with hints drawn from Freund's operation of total extirpation of the uterus and Schröder's method of closing the stump with sutures after removal of the organ for tumours. Moreover, the constriction of the cervix was only temporary, an Esmarch's bandage being used for the purpose. The constrictor was tightened before the uterus was opened, and yet the child cried at once on being extracted. The abdominal incision was about eighteen centimetres long, beginning three centimetres above the symphysis. The uterus, still intact, was easily drawn out through this opening. At the same time two coils of small intestine were extruded, but they were easily replaced, and, to prevent a repetition of this occurrence, the upper part of the abdominal wound was closed with sutures at once. An Esmarch's bandage was now thrown around the isthmus, six centimetres below the ovaries, the uterus was opened, and the child was extracted. Only a very little venous blood issued from the uterine incision. Each broad ligament was now tied with two ligatures, the inner one reaching to the border of the isthmus, and the ligaments were then cut through. On the right side the uterine artery was seen to have been divided, and a special ligature was applied to it. The uterus was now severed by an incision near the isthmus. To close the stump, four deep sutures, including the whole thickness of the cervix, were applied, together with twelve superficial sutures. At this juncture, on removing the constrictor, a stream of blood from the left uterine artery welled up between the sutures. This was controlled by passing a double ligature through the stump, one thread of which was tied at the left-hand margin of the stump and the other at its top. The abdominal wound was closed with thirty sutures. The whole operation, with only one assistant, was over in three-quarters of an hour. The author suggests that, by rupturing the membranes at the beginning of the operation, the uterus may be lessened in size somewhat, so that it may be brought out through a comparatively short abdominal incision.—*New York Med. Journal*, Oct. 1880.

Prof. GUSTAV BRAUN reports (*Wiener Medicinische Wochenschrift*, No. 26, 1880) the following successful case. The patient was a rickety dwarf, aged 30, single, primipara. The measurements of the pelvis were: external conjugate, 16.0 centimetres; internal conjugate, 5.5 centimetres. The operation was commenced after the waters had burst. The recovery was uninterrupted. The bladder and rectum acted spontaneously on the third day after the operation. The vagina, after the abdominal wound had healed, was found to be drawn into a tense funnel-shaped tube, at the end of which the remaining part of the vaginal portion of the cervix could be felt, measuring 1 centimetre. The child was a live male, weighed 3300 grammes, and measured 49 centimetres in length.—*London Med. Record*, Nov. 15, 1880.

Extirpation of the Uterus after the Method of Freund.

Dr. RYDYGIER narrates (*Berliner Klinische Wochenschrift*, No. 45, 1870) a case in which he performed this operation for cancer of the uterus. The patient died the next day. Dr. Rydygier makes some remarks on the details of the operation. He regards it neither as one very easy of performance, nor as being extremely difficult. Before opening the abdomen, he inserted a speculum into the vagina, and cut through the vaginal mucous membrane all round near its attachment to the uterus. By this modification, he claims that the length of time the peritoneum is exposed is lessened; that the vaginal insertion is cut through more easily in this way than from above; that there is less risk, when it is divided thus, of wounding bladder or rectum; and that the incision made in this way can be more accurately executed so as to include all the diseased part. This part of the operation he performs in a different room from that in which the abdominal incision is made, and between the two parts he thoroughly cleanses and disinfects his hands. He does not use the three ligatures recommended by Freund; for he says they cannot always be tied tightly enough to surely prevent hemorrhage, and sometimes one of them includes the ureter. He ties the uterine artery separately, and says there is no difficulty in doing so. He believes that these modifications make the operation both more easy and less dangerous.—*Med. Times and Gazette*, Nov. 20, 1880.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

Salicylate of Soda Poisoning.

The disturbance of the special senses which results from salicylate of soda is usually believed to be confined to the ear. Slight disturbance of sight has, however, been recorded by several observers, and in a case recorded by GATTI complete transient amaurosis was observed. The patient was a girl, sixteen years of age, suffering from acute rheumatism, and had taken, in the course of ten hours, two drachms of the drug. Three hours after the last dose she awoke from sleep totally blind, with considerable mydriasis, but no disturbance of sensibility of the cornea or of the conjunctiva. There was no visible change in the fundus oculi. There was considerable deafness. The urine did not present the salicylic reaction. Ten hours later, on awakening from a sound sleep, sight had perfectly returned. Mydriasis and deafness continued for some time longer. Both urine and saliva continued free from the salicylic reaction, which seems to show that the drug was retained within the system instead of being eliminated.—*Lancet*, Nov. 13, 1880.

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Esportazione Utero-Ovarica, per Grave Angustia di Pelvi Rachitica, praticata et 3 Luglio, 1880, dai Sanitari dell' ufficio d'Igiene col Concorso di quelli di Beneficenza. Soprapparta da Nove Giorni. Guarigione della Madre, Relazione del Dottori RAMELLA CANDIDO e BRAMBILLA LUIGI. Torino, 1880.

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La Cura del Ginoocchio Valgo e degli Incunuzvamenti delle Ossa per Rachitide. Dott. PAOLO CRESCI. Carbonai.

Osteotomia del Condilo Interno di Ambo i Femori per Ginoocchi Valghi. Due Casi di Chirurgia Pratica. Pel Dott. COSTANTINO RAFFO.

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Case of Medullary Neuroma of the Brain. By WILLIAM OSLER, M.D.

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A Treatise on the Principles and Practice of Medicine, designed for the Use of Practitioners and Students of Medicine. By AUSTIN FLINT, M.D., Prof. of Medicine in Bellevue Hosp. Med. Coll., N. Y., etc. Fifth edition, revised and largely rewritten. Philadelphia: Henry C. Lea's Son & Co., 1881.

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ARTICLE I.

ON THE TREATMENT OF ANEURISM BY THE ELASTIC BANDAGE. By LEWIS A. STIMSON, M.D., Surgeon to the Presbyterian and Bellevue Hospitals, New York.

ON the 25th September, 1875, Staff Surgeon Walter Reid, of the English Navy, published in the *Lancet* an account of a case in which, a fortnight previously, he had cured a popliteal aneurism by the use of Esmarch's elastic bandage, after other methods of compression had failed. The case attracted so much attention in England that, within two years, Waquet¹ was able to give the details of seven published cases, all by English surgeons, and all but one successful. A year later, Petit² collected twelve additional cases; and in January, 1879, Dr. R. F. Weir³ added five more to the list, one being his own. I have since collected enough, mainly by the aid of the *Index Medicus*, to make a total of sixty-two cases in which the bandage, or the rubber tubing, or both together, have been used for the cure of aneurism. With three exceptions (axillary, internal circumflex, and anterior tibial) the aneurisms thus treated were all of the popliteal or femoral artery, and the great majority were popliteal.

The idea of using the bandage was suggested to Dr. Reid the day before he put it in practice, by seeing a limb kept empty of blood by this means for seventy minutes, during an operation for necrosis, without subsequent injury or inconvenience to the patient. He had then been using genu-flexion and tourniquets in the case of aneurism for about three weeks,

¹ Sur le traitement des Anévrysmes des membres au moyen de l'appareil élastique d'Esmarch, Paris, 1877.

² Bulletin générale de Thérapeutique, 1878, vol. xciv. p. 458, 504, 543.

³ American Journal of the Medical Sciences, Jan. 7, 1879.

without having obtained more than a temporary arrest of pulsation, and, thinking that the failure was due to incomplete arrest of the circulation, substituted the bandage. He carried it tightly up the leg, loosely over the tumour, so as not to compress it, and then tightly again over the lower third of the thigh. The rubber tubing was then applied, and the bandage removed. At the expiration of fifty minutes, the pain had become so severe that the tube was removed, two Carte's compressors having first been adjusted over the upper portion of the femoral artery. By their aid the circulation was controlled for two hours longer, when the aneurism was found to be pulseless. As a precaution intermittent pressure with the tourniquet was maintained for a day or two, and then the patient was pronounced cured.

At his death, a few months later, the aneurism was found¹ reduced from its original size of a hen's egg to that of a small walnut; it was filled by a dark mass of cheesy consistency, evidently the remains of a blood-clot, and on some portions of its wall were strata of laminated fibrin, some of which were partly split off and turned inwards. The wall of the sac was well defined and not thick. The artery was obliterated by fibrous tissue for two and a half inches above the sac. The laminated fibrin was thought by Dr. Reid to have formed during the earlier attempts to cure by compression, and the displacement of portions of it to have been the result of the shrinking of the sac.

A similar condition was found at the second and only other recorded autopsy after a cure by this method;² there was a central blood-clot, and the artery was occluded, but there was no laminated fibrin, and the wall of the sac was very much thickened.

In the two fatal cases, in which death followed as a consequence of the operation, the sac was found filled with soft, recent clot, which in one of them extended up the artery (the anterior tibial) to and into the popliteal.

These autopsies indicate the process by which a cure is obtained in the successful cases: the blood retained within the sac coagulates during the application of the bandage; the clot increases during the subsequent compression of the artery and occludes it at its point of junction with the sac so effectually that no blood passes through. As the serum is absorbed and the clot shrinks, the wall of the sac follows it, and may also increase in thickness, probably as the result of the irritation of the clot. The same irritation of the wall of the artery near the orifice of the sac leads to the formation of granulations which permanently close the vessel. The incompleteness of the clot and the subsequent occlusion of the artery by it are shown by the fact that in the majority of the recorded cases of cure

¹ *Lancet*, Aug. 5, 1876.

² Wagstaffe, *Lancet*, 1876, ii. p. 461, for case; and *Trans. Path. Soc. of London*, vol. xxix. p. 72, for autopsy.

pulsation was noticed in the sac on the removal of the bandage if the artery was not compressed, but remained permanently absent after compression, digital or instrumental, had been maintained for a few hours.

The same facts explain the frequent failures, which present two clinical forms. In one the tumour shows no change on the removal of the bandage; coagulation has not taken place. In the other, after a period of variable length, during which pulsation has been slight or even entirely absent, it reappears with its original force, and the aneurism continues to increase. The blood has found its way past the clot, the more freely as the latter contracts, and has re-distended the sac. What becomes of the clot under these circumstances is a matter of conjecture; it is probably disintegrated and washed away, the particles being small enough not to cause obstruction of the larger vessels. Or possibly it may remain unbroken within the sac and grow by new deposits sufficiently to effect a cure, for Mr. Rivington¹ states that one or two cases have come under his observation, "in which, after prolonged application of Es-march's bandage, the symptoms were barely relieved, but after the lapse of a certain time from the application the aneurism ceased, as it were, spontaneously to pulsate." I have found no record of such a case, but the prompt recourse which was had to ligature after all but one or two of the failures would of course prevent the observation of such a process. In one case, however, Mr. Manifold's,² in which the patient was dismissed "cured," the subsequent history states that slight pulsation existed at the time of his dismissal, remained unchanged for six months, and then increased so much during the following eight months that he sought admission to another hospital, and was cured by instrumental compression.

The sixty-two cases I have collected require to be grouped in three classes according to the method of treatment. In the 1st, which embraces fifty-two cases, Dr. Reid's method was used with or without certain slight and apparently unimportant variations; in the 2d, five cases, the elastic



Specimen from Mr. Wagstaffe's case of popliteal aneurism cured by the elastic bandage.

¹ Lancet, Oct. 16, 1880, p. 610.

² Lancet, 1878, i. p. 86, and 1879, ii. p. 575.

bandage or the rubber tubing alone was repeatedly used alternately with a tourniquet or digital pressure to arrest the circulation completely for several hours; in the 3d, five cases, the bandage was used for a short time each day for many days, without any compression of the artery in the intervals, or with a tourniquet loosely applied.

The fifty-two cases of the 1st group furnish twenty-eight cures, twenty-two failures, and two deaths. Of the cures twenty-four were obtained by a single attempt, and four by two attempts separated by an interval of from one to four days. The bandage was applied in a majority of the successful cases for about an hour, the extremes being fifty minutes and three and a half hours; in some, it was carried loosely over the tumour so as not to compress it; in others, the tumour was left entirely uncovered, and in some the patient was made to stand up after the bandage had been placed upon the leg, and before it had been placed upon the thigh, in order that the sac might be fully distended. In two cases Mr. Heath bandaged the thigh from above downwards, so as to over-distend the sac, thinking that by this means the tendency to coagulation would be increased, but he adds that experiments subsequently made to verify the theory gave a negative result. After the removal of the bandage the artery above the tumour was compressed with the tourniquet or the fingers, usually for from two to nine hours, but in one case for only one hour and in another for five days; in one case genuflexion was substituted for pressure above. In two or three cases pulsation returned the next day, and was then definitively arrested by compression for a few hours.

In twelve of the twenty-two failures the same method was pursued in nineteen different attempts; in the remaining ten, with eighteen attempts, no pressure seems to have been used after the removal of the bandage, but in one of these the bandage was kept on for six hours, and in another for three hours, periods longer even than some of those during which the combined use of the bandage and tourniquet had effected a cure. In at least five of the first twelve the method was thoroughly and skilfully employed, with every detail used in most of the successful cases; the sac was kept full and the pressure was maintained for a sufficient length of time. They show therefore, when added to the twenty-eight successful cases, that the method even when rigorously employed may be expected to fail in at least fifteen per cent. of the cases. With reference to the remaining seven of these twelve failures it may be objected with some reason that the method was used improperly or for an insufficient length of time; as the details are not fully given, this question cannot be settled.

The relative percentage of success, however, is not sufficient to determine whether the method should or should not be used. If an attempt involves no risk, if its failure leaves the patient as fit to undergo other treatment as he was before, it would be not only proper but perhaps even obligatory to make it, even if the percentage of success was much less.

The alleged dangers are of three kinds: 1st, gangrene, as the result of the size or extension of the clot; 2d, the greater probability of the occurrence of gangrene if recourse must be had to the ligature after failure; 3d, such as may arise in consequence of the increased arterial tension in the other parts of the body during the attempt.

1. Death has followed the employment of the method in two cases; in the one with apparently impending, in the other with fully developed, gangrene. The cases are those of Dr. Weir and Mr. Rivington.

Dr. Weir's patient¹ was a man 38 years of age, with a popliteal aneurism as large as the fist and of four months' duration. An elastic bandage was placed upon the leg, and another upon the lower half of the thigh, the aneurism being left uncovered between them, and the rubber tubing was applied tightly at the upper margin of the second bandage. Two and a half hours afterwards the tubing was removed, but the bandages were retained for nearly two hours longer, together with a tourniquet which was adjusted when the tubing was taken off. The aneurism was then found to be consolidated, but pulsation returned in it on the following day; the leg was normal in temperature but somewhat swollen.

A second attempt was made three days after the first, and in the same manner; the tubing was taken off at the expiration of three hours and fifty minutes; and the bandage was retained four hours longer;² after its removal a tourniquet was applied for half an hour. A seven pound bag of shot was laid over the artery at Poupart's ligament as a precautionary measure, and the patient, who had borne the operation without ether and with the aid of only ten minims of Magendie, was left for the night.

The next morning he complained only of feeling a little weak, but his pulse was almost imperceptible at the wrist. Aside from the pulse there were no marked symptoms of shock, his temperature was 101.2°; his pulse 78. The leg, which was cold, was wrapped in cotton, hot air directed under the bedclothes, and whiskey administered by the mouth every half hour. In the afternoon the leg had become warm except upon its anterior surface and the dorsum of the foot, but the patient's general condition had not improved; the temperature was 99°; pulse 58, and entirely absent at the wrist. He died 27 hours after the cessation of the compression.

At the *autopsy* the leg measured two and a half inches more in circumference at the calf than the other; it showed slight serous infiltration and minute capillary hemorrhages, especially in the deeper parts. The veins were normal and filled with recently clotted blood. The femoral artery contained no clot, and was rough and thickened. The artery below the tumour was occupied to some distance beyond the bifurcation of the popliteal by a small amount of soft, recent clot. The aneurism, which arose from the anterior portion of the artery and communicated with it by an oval opening one and a quarter inches long, was filled with well-formed, recent clot. There was advanced fibrous phthisis of both lungs, granular fatty degeneration of the heart, and atheroma of the aorta. The kidneys were intensely congested, but otherwise normal.

The conclusion which Dr. Weir drew from the case is eminently proper and judicious. He says that although there were no positive signs of gangrene, and the death may be attributed to another cause, possibly shock and the degenerated heart, yet it would have been more prudent to remove the bandage earlier. He recommends, therefore, that the tubing and bandage should both be removed after two hours, and the tourniquet

¹ Archives of Medicine, vol. iii. 1880, p. 207.

² It was Dr. Weir's intention to have the bandage retained for only two hours, but his directions were misunderstood.

then applied for two hours more, or longer if rendered necessary by continued pulsation in the tumour.

In Mr. Rivington's case¹ the aneurism was of the anterior tibial artery, and had ruptured externally before the patient came under observation. Esmarch's band was applied in the usual manner for an hour and followed by the tourniquet. Pulsation reappearing when the latter was loosened, it was reapplied and kept on all night. The next day the clot in the external opening gave way, and severe hemorrhage ensued; it was checked by the tourniquet. The man refused amputation, and Esmarch's bandage was reapplied for one hour and ten minutes, followed by digital pressure "for some time longer." "Pulsation had not wholly ceased in the aneurism after the removal of the elastic tube, and the circulation promised to become re-established in the leg and foot. But when coagulation in the sac became complete, and all pulsation and murmur were abolished, it was found that, whilst the heel became hotter than usual and showed marked evidence of the re-opening of a collateral circulation, the anterior part of the foot and the toes were cold." On the 8th day a line of demarcation had formed in the lower third of the leg, and a few days afterwards the patient died. The condition disclosed by the autopsy has been described above.

As the patient refused to accept the amputation which was urged both by Mr. Rivington and by Mr. Hutchinson who saw the case in consultation, and as gangrene would probably have followed any other attempt at conservative treatment, it cannot be fairly charged to the method, although undoubtedly caused by it. Mr. Rivington employed it only because he was allowed to do nothing better, and because it was necessary to do something to arrest the hemorrhage. Dr. Weir's case, therefore, is the only fatal one that is chargeable to the method, and, if the advice he has given is followed, it seems probable that it may long remain so.

2. The second question, that of the greater probability of the occurrence of gangrene if recourse must be had to the ligature after failure of elastic compression, is raised by Mr. Bryant's experience in one case and by the fact that this probability has been shown to be increased after ligature by previous compression of the artery by the tourniquet or finger.

Mr. Bryant² applied the bandage twice, for three hours each time, with an interval of four days, for a popliteal aneurism in a man of 45 who could bear neither instrumental nor digital pressure upon the artery. Morphia was used in the first application and ether in the second to relieve pain. The first attempt was followed by hardness of the sac, which, however, entirely disappeared before the second was made. Of the second he says "little had been gained from it." A fortnight later he tied the femoral artery with catgut; the wound healed by immediate union, but the foot "soon became the seat of anæmic gangrene, and a fortnight after the application of the ligature was amputated in the middle of the leg, and a good recovery followed."

This is the only instance of gangrene in the sixteen cases of the list in which it is recorded that the ligature was used after failure of the bandage, and the number is too small to determine whether or not the propo-

¹ Lancet, October 16, 1880, p. 608.

² The Practice of Surgery, 2d Amer. ed. p. 324.

tion is greater than that following simple ligature, two or perhaps three in eighty-seven according to Mr. Holmes. (*Lancet*, 1874, ii. p. 860.)

But even if gangrene should be twice as frequent after secondary ligation, its relative frequency in the total number of cases treated by the bandage would probably not be greater than after primary ligation. The explanation suggested by Mr. Bryant, and probably the correct one if a causal relation exists, is the plugging of the small arteries by fragments of the clot.

3. It has been shown by observations made with the sphygmograph that while the elastic bandage is upon a limb the intra-arterial pressure is increased throughout the other portions of the body, and it has been suggested that this increase might be dangerous if certain conditions of the heart or arteries should coexist. No accidents from this cause have yet been recognized, and if such a contra-indication should exist in any given case the danger can be avoided by using the tubing alone, as has been done in two cases. By this means the amount of blood normally contained within the limb would be retained there during the operation, and would not be forced out to augment that contained within the other portions of the circulatory system.

The second of the three groups into which the list is divided contains five cases, those in which the bandage or the tubing alone was used two or more times, alternately with instrumental or digital pressure, to arrest the circulation for several hours. It furnishes four successes and one failure, the latter subsequently treated by ligature which was followed on the thirtieth day, the wound having then been healed a week, by fatal secondary hemorrhage. In the shortest case the bandage was applied for sixty-five and thirty-five minutes with intermediate and subsequent digital pressure for fifty and eighty-five minutes. In the longest the bandage was applied four times for two hours each time, and the tourniquet in the intervals and subsequently to complete twenty-four hours. In the others the total period of compression was from eight to nine hours; in one of them the tubing was used without the bandage, and in another, the unsuccessful one, pulsation returned the next day, and the tourniquet was reapplied for three hours, but with only temporary success; the ligature was then used.

In the third group, five cases with three successes and two failures, the method employed was radically different. Three of the cases were treated by Gersuny,¹ one by Raab,² and one by Esmarch.³ The general plan was to apply the bandage and the tubing with just sufficient force to arrest the pulsation, and to leave it in place for about half an hour; to repeat this daily or twice a day for several weeks, and to compress the artery with a tourniquet or shot-bag for two or three hours after each application of the bandage. Gersuny cured his first case in eighteen days by twelve appli-

¹ Gersuny, *Archiv für Klinische Chirurgie*, 1879, vol. xxiv. p. 798.

² *Ibid.*

³ *Centralblatt für Chirurgie*, 1879, vi. p. 65.

cations of thirty minutes each, and his second case, aneurism of the upper portion of the femoral artery, in twelve weeks by applications for twenty to twenty-five minutes daily during four weeks, and for fifty minutes twice a day during the remainder of the period. In this case the aneurism was situated so high upon the thigh that the rubber tube crossed its upper portion, and the bandage was drawn snugly over its lower portion through fear that otherwise the pressure of the tubing might cause its rupture. Consolidation was complete at the end of the treatment, but slight pulsation returned at intervals and was repeatedly arrested by a few applications of the bandage made by the patient himself. His third case was a popliteal aneurism upon the other leg of the same patient. One application, lasting for from thirty to fifty minutes, was made daily for ten days, and then two for from one and a quarter to one and a half hours daily for ten days longer. The aneurism became harder and smaller, but continued to pulsate, and the femoral artery was tied a year afterwards. In Raab's case forty-four applications of twenty minutes each were made in seven weeks, each followed by compression of the artery for from fifteen minutes to four hours. The aneurism apparently ruptured during the treatment, and was finally cured. In Esmarch's case, a femoral aneurism in the lower part of the thigh, three applications of half an hour each, not followed by compression of the artery, were made daily for fourteen days. As no appreciable gain had been made, the treatment was then abandoned.

The conclusion to be drawn from all these cases seems to be that we have in the elastic bandage an efficient means for safely shortening the duration of the treatment by compression of popliteal and some femoral aneurisms. The greater efficiency and the more speedy action of the method are apparently due mainly if not entirely to the arrest of the circulation through the collateral channels as well as through the main artery, thus securing the absolute stagnation of the contents of the sac. Consequently, the rubber tubing which is drawn tightly twice or three times about the limb above the aneurism is to be considered the efficient part, and the principal, perhaps the sole, benefit from the bandage is that of making a less severe constriction by the tubing sufficient.

The details of the method involve the retention of the bandage or tubing for one or two hours, and the compression of the artery by a tourniquet or the fingers for several hours afterwards. This compression should be firm enough to prevent the flow of blood through the artery, but after it has been kept up for an hour or two it should be temporarily intermitted, as Dr. Weir suggests, in order to ascertain if pulsation returns in the sac. If pulsation returns within a few hours after an apparent cure has been obtained the artery must be again compressed for some time. The elastic bandage should not compress the aneurism, for the cure is to be effected by filling the sac with a clot, and if this clot is smaller than the natural capacity of the sac it will be easier for the blood to make its way into the

latter after the removal of the compression, and thus perhaps prevent a cure. If the primary clot has extended upwards into the artery, this of course is less likely to happen, but as the surgeon cannot be sure that such extension will take place, it is prudent to act as if it would not. On the other hand, hyper-distension of the sac, as practised by Mr. Heath, seems unnecessary and perhaps even dangerous. The clot is in itself a source of irritation to the wall of the sac, and if this slight irritation is increased by extreme tension it may pass beyond the degree which leads to tissue-production and cause suppuration.

The introduction of needles or of a coagulating injection has been suggested but never yet practised. It might be proper in a second application in those exceptional cases in which the first trial has not caused coagulation, but as it involves a slight risk of suppuration it will probably be thought advisable not to employ it in the first attempt.

Note.—The following is a list of the sources from which the cases above referred to have been obtained :—

Petit, Bulletin gén. de Thérapeutique, 1878, pp. 458, 504, 543. *Weir*, Am. Journ. Med. Sciences, Jan. 7, 1879; N. Y. Med. Journ., vol. xxix. p. 520, and vol. xxxi. p. 637; Archives of Med. (N. Y.), 1880, iii. p. 207. *Gersuny*, Archiv für Klinische Chirurgie, vol. xxiv. p. 798. The Lancet, 1875, ii. p. 448; 1876, ii. pp. 184, 461; 1877, i. p. 571; 1878, i. p. 86; ii. p. 880, and Sept. 28; 1879, ii. pp. 81, 121, 238, 575; 1880, i. p. 289, ii. p. 608. Transactions of Pathological Society, London, vol. xxix. p. 72. Transactions of Clinical Society, London, 1879, vol. xii. p. 55. British Medical Journal, 1880, ii. p. 15. Transactions Med. Soc. Kings Co., N. Y., 1879-80, p. 223. Australian Med. Journ., May, 1879, p. 243. Bryant's Practice of Surgery, 2d Am. ed., p. 324. St. Bartholomew's Hospital Reports, vol. xv. p. 75. Centralblatt für Chirurgie, 1879, vol. vi. p. 65. Bulletins de la Société de Chirurgie, 1880, p. 570.

ARTICLE II.

A RECORD OF THE EPIDEMIC OF BREAK-BONE FEVER IN CHARLESTON, SOUTH CAROLINA, IN 1880. By JOHN FORREST, A.M., M.D., of Charleston, S. C.¹

THIS report is based upon the answers of twenty-one physicians of Charleston, to a series of questions prepared by the writer, and distributed to the profession in October last. It is necessary to state, that, according to the report of several physicians, a number of cases of break-bone fever occurred in Charleston in the autumn of 1879, some of which were remarkable for the severity of their symptoms. But after a spell of cold

¹ This paper was read before the Medical Society of South Carolina at the Anniversary meeting Dec. 12, 1880, as the report of the Committee on Epidemics and Meteorology, consisting of Drs. J. Ford Prioleau, T. Grange Simons, and Manning Simons, with which committee the writer was temporarily associated, by a resolution of the Society at a previous meeting.

weather in November, no more was heard of the disease during the winter. The winter was unusually mild, with scarcely any frost, and the summer was looked forward to with general apprehension, as likely to be a sickly one, especially as there had been extensive excavations made in the streets, for the purpose of laying water pipes, and also for paving, both of which works were continued into very warm weather.

The following notes of the weather, taken from observations carefully made in the southern part of the city, and beginning from November 1879, properly belong here.

On the 21st of November, 1879, occurred the first and only frost of that winter. The minimum temperature of the month was 30° F. In December the minimum temperature was 34°. The lowest temperature of the earlier part of the year 1880 was in January, 33°, so that we had no frost after the new year.

The mean temperature of the first three months of the year was 58.6°; very mild weather for the season. April was warm, maximum temperature 87°; mean 67°. The next five months were hot. In May the maximum was 89°; mean 73.7°. In June the temperature reached 100°, the maximum for the year; mean 80.6°. In July the mean temperature, 83.4°, was the highest of any month of the year. In August the mean temperature was 81.4°. In September it was 75.8°, and the maximum 89°.

From January to June the rainfall was inconsiderable, averaging for each of the six months 2.48 inches. In May was the least rainfall, 0.90 inch, and the fewest number of rainy days, 4, in the year. In July the rainfall was 5.77 inches. In August there was not much rain, but in the early part of September there was a good deal; so that, preceding the outbreak of the epidemic in July, we had had six months of dry weather.

From February to August, seven months, the prevailing direction of the wind was from the southwest.

* There were two thunder-storms on the 2d of June, the first lasted an hour, and the second two hours. On the 14th of the same month there was a third, lasting only a few minutes. In July there were three, on the 5th, 12th, and 23d, of which the first two were very violent. Others occurred on August 6th and September 8th.

During the first four months of the year 1880, there prevailed throughout the city a widespread epidemic of febrile roseola, or, as it was most generally called, the "German measles;" and in the early summer there were a considerable number of cases of remittent, intermittent, and typhoid fevers. But during the epidemic of break-bone fever, no other disease was generally prevalent.

The disease was not recognized as epidemic until the end of July, but cases are reported to have been seen at a much earlier date. One physician reports having been called to his first case on the 13th of March; another

in May. Three met with it in June, several in July, but the majority not until August, when it became general all over the city. Towards the end of September it began to decline, but still showed considerable activity in October, many of those who returned to the city in that month being promptly attacked. Cases have also occurred both in November and December, notwithstanding the occurrence of light frosts.

There was no distinction of age, race, or acclimatization among those attacked. Infancy and old age, the white man and the black, native and foreigner, those who had had the yellow fever and those who had not, were equally liable and suffered alike.

The origin of the disease is still involved in obscurity, the reports rather expressing what it is thought not to be, than declaring what it really is. No hint of a foreign origin, or of its having been imported, is thrown out, nor is it thought to be contagious. The opinion is all but unanimous that it is not malarial, in the ordinary acceptation of that term, and it is generally believed to be due to an atmospheric poison derived from as yet unknown sources.

The period of incubation has not been determined with any degree of certainty, and it is variously put down as extending from a few hours to a number of days.

The attack commenced sometimes suddenly, at other times after a varying period of malaise. It was generally ushered in with chilly sensations, or an actual chill, amounting in some cases to a rigor, accompanied by a rise of temperature and most frequently headache, followed by pain in the back and limbs.

The pulse is for the most part described as full and frequent, especially at first; but, after the subsidence of the fever, it became slower even than normal, nor was its frequency as a rule at any time in proportion to the temperature. The number of beats in a minute ranged upwards from 90 to 140, and again sometimes fell below 60, and in one instance to 48. It was often weak and compressible, and sometimes intermitting.

The temperature as a rule was not very high, the thermometer ranging usually from 100° to 104° , but in some instances 105° and $105\frac{1}{2}^{\circ}$ were noted. On the subsidence of the fever the temperature sometimes fell below the normal, as low in one instance as 97° .

According to the majority of the reports the fever, as a rule, showed neither remissions nor intermissions. Doubtless there were oscillations of the thermometer in all cases, and slight differences between the morning and evening temperatures, but it seems to have been most generally a continued fever of a single paroxysm. Yet it is certain that both remissions and intermissions of irregular character occurred in many cases, as testified to by no inconsiderable proportion of observers. Relapses, too, are reported to have been not uncommon, but no regular period could be assigned for their recurrence, and many of these would appear to have been

rather recurring paroxysms after remission or intermission than genuine relapses; such, for instance, as are spoken of as occurring "on the second day," or "from a few hours to a day or two." It is also probable that malarial influences impressed their character upon many cases.

The respiration, generally hurried at first, afterwards corresponded with the pulse.

The tongue, generally moist, in many cases broad, thick, and flabby, in others elongated and pointed, was at first clean or coated white, subsequently becoming brown in the middle, the margin and tips remaining clean, or taking on a deep pink or red hue. Sometimes the whole organ was covered with a thick, brown, ill-looking fur. In some cases there was a tendency to dryness, and, in one case, the tongue is described as having been "dry, brown, fissured, and bleeding."

The appetite failed completely in most cases, and no relish was retained for any food whatever, even water being repulsive to the taste. Thirst was not usually much complained of. Digestion was impaired, and remained so in many cases even after convalescence. There was a great deal of nausea in the majority of cases, and frequently vomiting.

The bowels were inclined to be constipated, especially at first, though not unfrequently diarrhoea, in some cases of a dysenteric character, succeeded. Very black stools full of decomposed blood are mentioned in one report as having been not uncommon, and actual hemorrhage from the bowels occurred in some cases.

Pain, which was one of the most constant features of the disease, was complained of in almost every part of the body, now in one place now in another, generally in several places at once. The head, the small of the back, and the lower limbs were most commonly the seat of pain. Headache was mostly frontal and very intense. Other regions mentioned, where pain was complained of, were the joints large and small, the epigastrium extending to both hypochondria, the region of the bladder, the abdominal walls, along the spine, the bowels, the face, and the skin.

Very little swelling was observed anywhere. One report speaks of "slight swelling at the seat of pain, when that was in the joints." Another says it was sometimes seen about the face, particularly the eyes, also on the hands and feet. A third mentions swelling of the parotid and cervical glands in certain cases. In one case, verbally communicated to the writer by the patient (an M.D. and a gentleman distinguished in science), on the invasion of the fever, the hands swelled up and became red and painful, the pain extending up the arms. The symptoms suggested poisoning by poison-plants, but there had been no exposure to such contact. Some cases of orchitis were also verbally reported.

Nervous symptoms were very prominent in most cases from the first. Headache, restlessness, sleeplessness, and mental depression were nearly always present, sometimes there was tremor of the hands, and delirium

was not uncommon, especially in children. Three cases of congestion of the brain were reported, two of them fatal.

A symptom present in the great majority of cases was a cutaneous eruption confined to no one region, but found on the face, neck, chest, limbs, palms, etc. It was by no means uniform in character, assuming in different cases the forms of erythema, roseola, sudamina, urticaria, and even of eczema. It was followed by desquamation. The time of its appearance was most frequently on the subsidence of the fever, but sometimes it was coincident with the onset of the disease. It is said sometimes to have been the only symptom seen.

The skin was usually dry at first, but later on profuse sweating was common; and sometimes the disease was ushered in with sweating, which continued throughout.

Hemorrhage from the mucous surfaces was very common. Bleeding at the nose was the most frequent, but it was also observed to take place from the gums, tongue, fauces, pharynx, stomach, and bowels. Pulmonary congestion with bloody sputa is reported in two cases, and dysenteric discharges in several. The catamenia in a number of cases were brought on in advance of the natural period, and the quantity of the discharge was augmented.

Premature labour occurred sometimes, but no case of miscarriage in the early stages of gestation is reported.

The urine was greatly diminished in quantity; in one case the patient, a robust man, passed only eight ounces in the twenty-four hours for the first two days. The reaction was acid, and the specific gravity very high. It became turbid soon after passing, with copious deposit of urates. Albumen was rarely found, and, except in complicated cases, only when the fever continued high for several days.

No single symptom invariably characterized an attack, and, to quote the language of a distinguished physician in his answer to the questions, "there was more than in any other disease great want of uniformity as to mode of invasion, severity of disease, character of symptoms, duration of attack, etc. etc. Prognosis as to ultimate favourable termination was about all one could venture to predict."

The following sequelæ were observed: excessive and obstinate prostration nearly always, sleeplessness very commonly, night sweats, anæmia, hysteria, neuralgia, diarrhœa, boils and carbuncles, conjunctivitis, bronchial catarrh, deafness, aphonia, œdema, icterus, cystitis, rheumatism, and temporary paralysis of the lower limbs.

The treatment generally adopted was symptomatic, and consisted in the use of mild cathartics, diaphoretics, anodynes, arterial and nervous sedatives, sinapisms, stimulants, and tonics, *pro re natû*. Quinia was used as a febrifuge and tonic, but is not reported to have exercised a specific influence over the disease either prophylactic or curative.

Of 2015 patients treated, 7 died, but of these more than one-half died from the disease under which they were previously labouring. The record is as follows: died of epilepsy, 1; syphilis, 1; hip-joint disease, 1; *convulsions*, 1; *congestion of the brain*, 2; *cerebral embolism*, 1. In the last four cases death was probably due either to the severity of the disease itself, or to the consequent prostration.

To estimate accurately the number of cases that have occurred in the city would be very difficult, as by far the majority of those attacked availed themselves only of domestic therapeutics without employing any physician. We have, however, obtained from forty-one physicians the number of cases each attended, the total amount being 4036. As there are between fifty and sixty practitioners of medicine in Charleston it is safe to estimate the number of cases treated at upwards of 5000; and if, as is generally allowed, not more than one-third of the sick received professional attention, there must have been more than 15,000 cases of the disease.

Outside of Charleston the disease prevailed at Mount Pleasant, Sullivan's Island, Summerville, Beaufort, Port Royal, Columbia, and Aiken, according to reports received; and it is said to have occurred at other places from which we have had no word.

In making a general comparison of this with previous epidemics, we find somewhat similar meteorological conditions, as, great heat, want of rain, absence of thunder-storms, and prevailing southwest wind. The symptoms of the disease in this epidemic, however, do not appear to have been generally so violent and distressing as in some former ones, nor was the epidemic so nearly universal.

In conclusion, I beg to return my thanks to the other members of the Committee on Epidemics and Meteorology of the Medical Society of South Carolina for their kind and valuable assistance; also to Mr. John Grover, of the U. S. Signal Corps, to whose kindness I am indebted for the information on the weather; and lastly, and in an especial manner, to those gentlemen of the profession in Charleston and throughout the State, who have so politely troubled themselves to answer the questions propounded, and have evinced in personal conference and by letter so much interest in furthering my object, which was simply to place upon the minutes of the Medical Society of South Carolina a record of an epidemic so remarkable for its wide-spread character, the severity of its symptoms and a minimum of mortality.

ARTICLE III.

ON NON-MORTAL FRACTURES OF THE BASE OF THE SKULL, WITH AN ACCOUNT OF ONE HUNDRED AND THIRTY-FIVE CASES. By JOHN A. LIDELL, A.M., M.D., of New York, late Surgeon to Bellevue Hospital, Inspector of the Medical and Hospital Department of the Army of the Potomac, etc. etc.

THE base is the most fragile part of the cranial dome. It is less able to withstand assaults from without than the vault, because, 1, it is considerably flatter in shape, or less strongly arched; 2, it is much thinner and more brittle in several places, *e. g.* the orbits, the nostrils, the occipital base, etc.; 3, it is, in general, quite destitute of diploë; 4, its sutures are mostly not serrated; 5, it is perforated by many characteristic foramina, and fissures of large size. When from any cause the skull is strongly compressed, whether vertically or laterally, it gives way first at the base. No wonder then the skull gets broken at the base much oftener than elsewhere, in the casualties of every-day life. Moreover, observation has shown that fractures of the cranial base are very common; so much so, indeed, that they form by far the greater part of the fatal injuries of the head which are met with in our civil hospitals. (*Prescott Hewett.*)

But fractures of the basis cranii are also very deadly. Some experienced surgeons hold that recovery from this lesion only very seldom, if ever, occurs. For instance, the sagacious Hennen, who may justly be taken to represent a numerous class of our contemporaries, states that "fractures affecting the basis of the cranium are universally fatal." (*Principles of Military Surgery*, p. 271, Am. ed.) Other eminent surgeons likewise, maintain that this lesion generally proves fatal. Samuel Cooper says: "Experience teaches that fractures of the basis of the skull are extremely dangerous, because they are generally attended with extravasation, or followed by inflammation of the brain." (*Dictionary of Practical Surgery*, vol. i. p. 467, Am. ed.) Guthrie also says: "Fractures of the base of the cranium are generally fatal, but not always so; for some persons live a considerable time afterward, and appear to die from other causes; so that partial, if not perfect recovery is possible." (*Commentaries*, etc., p. 317, Am. ed.) The writer, however, has been led by his personal experience and researches to believe that recovery from this accident, more or less complete, occurs very much oftener than Guthrie states or surgeons in general suppose; in fact, that patients having fracture of the basis cranii not unfrequently get well. In proof he offers the histories of six examples which have passed under his own observation, together with brief abstracts of one hundred and thirty-one cases which have occurred in the practice of American surgeons in recent years.

CASE 1. *Compound Comminuted Fracture (gunshot) of Cranium at Base of left Cerebral Hemisphere (anterior lobe); Recovery.*—James F. (Confederate), aged 18, wounded by a conoidal bullet, and captured Nov.

7, 1863. The missile penetrated the *right* supra-orbital arch about one inch from the internal angular process, and passing obliquely to the left, fractured the orbital plate, and escaped from the *left* temple, half an inch above the zygoma, and midway between the rim of the orbit and the left ear. He was struck senseless, and did not come to himself until two days afterwards, while being taken out of the ambulance at Stanton Hospital, to which he was brought on November 9th. Left eye sightless. He had much pain in the head, but no fever, nor delirium, nor general paralysis. Ordered him to be kept in bed free from noise and excitement, to have the injured part of head kept constantly wet with ice-water, and his bowels kept loose with Epsom salt. Nov. 21. Left eyeball painful, hot, and protruding from the socket, on account of swelling behind it; conjunctiva dark-red; some purulent discharge from wound. 30th. Swelling in left eye-socket, pain, and heat much diminished. Purulent discharge continues, but mostly from the wound of entrance. Dec. 15th. He cannot open the lids of either eye without applying his fingers to them. January 1, 1864. He now opens the right eyelids without manual assistance, and sees very well with that eye; left eye continues sightless; some purulent discharge from both wounds; but little bone has come away. February 1. Both orifices have healed with a firm cicatrix; his general health is good. There is ptosis of left upper eyelid, with utter inability to raise it; left eyeball completely sightless, but he can rotate it inward, downward, and outward, but not upward. There is paralysis of the left optic nerve, and of the branches of the motor oculi that supply the superior rectus and the levator muscle of the upper lid. There is now no trouble whatever in the right eye. March 28. Being in excellent condition, he was transferred to the Old Capitol prison for exchange.

This patient did not exhibit hemiplegia because the brain-substance was not compressed. He did not exhibit paralysis of any organs excepting the left eye and certain muscles connected therewith, whose nerves were injured by the missile. He did not exhibit loss of speech (aphasia) nor any special disturbance of that function, which seems rather remarkable, if "the seat of articulate speech" is solely "located in the posterior portion of the third left frontal convolution," as often asserted. However, it is not improbable that, in this man's brain, the seat of articulate speech was located on the *right* side, in the posterior part of the third *right* frontal convolution, where it escaped all injury.

The loss of consciousness, which was complete, and likewise protracted through a period of about two days' duration, was doubtless caused by "shock" and by concussion or commotion of the brain. If it had been produced by compression of that viscus, hemiplegia of the right side would also have been present.

The principal dangers to which he was exposed during the after treatment were connected with the occurrence of inflammation of the membranes and substance of the brain, but this accident was happily averted, and the man made an excellent recovery. Moreover, the plan of treatment was simply antiphlogistic, and consisted of quietude, of cold applied to the wounded part, of a meagre diet, and the administration of saline purgatives; and under it the man made an excellent recovery.

CASE 2. *Gunshot Wound Destroying Right Eye, and Fracturing Base of Skull; Missile lodged in Right Temporal Region, where it was found and extracted, seventy-nine days afterwards; Recovery.*—J. A. F., aged 20, wounded May 2, 1863, by a conoidal musket-ball, which struck the left side of the bridge of his nose, and broke it down; thence passed obliquely backward, upward, and outward toward the right side of head, lacerating the lower lid of right eye, destroying the right eye itself, and after going through the outer wall of the orbit, lodged in parts beyond and was not extracted. He fell down when hit, but thinks he did not lose consciousness. He found himself to be very dizzy, and that the dizziness was much increased by arising. He did well, the wound healed, and on June 13, he was furloughed. On July 20, he was admitted to Stanton Hospital, under the writer. The bridge of his nose was seen to have been broken down, the lower lid of right eye lacerated, and the right eyeball destroyed, but these wounds were already healed with a good scar. Further examination disclosed a small, hard, circumscribed swelling in the right temporal region, about one inch above the zygoma, believed to be caused by the missile. Accordingly, this swelling was opened by an explorative incision, and the missile, originally cylindro-conoidal, but now much battered and altered in shape, with a small fragment of bone sticking therein, was found lying beneath the temporal fascia and impacted, as it were, in the substance of the temporal muscle, from which it was removed with some difficulty seventy-nine days after the wound was inflicted. The operation was not attended with the escape of any pus, or the removal of any fragments of bone. The dizziness which previously had entirely disappeared, returned on removing the bullet. Afterwards the patient did very well. August 2. Wound of operation nearly healed, original wound doing well; has no dizziness unless he exerts himself. The patient, it is believed, made a good recovery. The missile was sent to the Army Medical Museum on August 3.

This case bears a strong resemblance to the last. In both, the lesion occurred at the base of the anterior part of a cerebral lobe, one eye being wounded and the anterior cranial fossa fractured. In both, the symptoms of cerebral concussion were more or less strongly developed, without, however, the occurrence of hemiplegia, or any evidence, whatever, of cerebral compression. The main difference between them was that in one case the left, and in the other the right orbit was wounded. In the first case the track made by the wall was higher up in the brain than it was in the last, and consequently the cerebral symptoms were more strongly marked and threatening than they were in the last case. Dizziness was a prominent and troublesome symptom in the last case. It was probably caused by cerebral anæmia, for it was increased by assuming an erect posture, and by physical exhaustion, such as that which results from a long walk, etc. However, in the end this patient also made a good recovery; but I cannot help thinking that he would have done much better if he had not been furloughed, if instead thereof he had been kept at rest and had the antiphlogistic regimen and plan of treatment enforced until his recovery was complete, as was done in the last case.

The following example was under the writer's observation for a considerable period of time:—

CASE 3. *Gunshot Fracture of Os Occipitalis, etc., at Base of Skull, on left side; Missile penetrated Brain and remained unextracted; Recovery; patient known to be still living nearly eight years afterwards.*—Samuel D. S. was wounded on August 27, 1862, by a carbine ball, which struck his head at a point two inches behind the left ear, and produced, apparently, only a scalp wound across the median line. He fell to the ground, and was very dizzy, but did not lose consciousness. When seen by his surgeon a probe was passed to the depth of two inches into his brain-substance, along the track of the missile, but without discovering its locality. He was sent to the third division hospital, at Alexandria. The extent of the injury was not suspected, and the case was treated as a superficial scalp wound. On September 3, he was admitted to the Broad and Cherry Streets Hospital, at Philadelphia. Healthy suppuration continued, and a fragment of bone was discharged from the wound. On November 6, the wound being healed, he was returned to duty. Two days later, he was admitted to the Ryland Chapel Hospital, at Washington, to be treated for a large abscess of the left ear. On December 5, when the hospital was closed up, he was transferred to the Stanton Hospital, then under the writer's charge, along with a number of the residual patients. The discharge from this abscess of the ear had not yet entirely ceased, and he was suffering constantly from headache and pain about left ear, which were greatly increased by exposure to cold; he also suffered from vertigo and from acute pains, darting across the base of the brain, from the right temple to the cicatrix, behind the left ear. There was no paralysis, and the functions of the body were generally well performed. The cicatrix, though tender, was firm. Soon afterwards he was allowed, at his own request, to serve in the capacity of nurse; but, in two weeks' time, he was relieved from this task, as the pain and vertigo were unduly increased, and he was becoming pale and emaciated. He was discharged from the service on January 19, 1863. It was the opinion of several surgeons who examined the injury, including the writer, that the missile still lodged in the cranial cavity. On January 8, 1864, this man, while visiting Washington, in pursuit of his pension, called on the writer, at Stanton Hospital. His condition then appeared to be about the same as it was in January of the preceding year, when he was discharged from the service. The wound had remained closed. On March 2, 1870, his claim for pension was still pending, and his disability rated three-fourths, and probably permanent.

After an attentive consideration of this man's case, there appears to be no good reason to doubt that the missile penetrated the brain-substance and lodged; that the aural abscess was caused by the gunshot lesion of the skull; that the chronic pains at the base of the brain and left ear, of which he complained so much, were also due to the gunshot lesion, and that at last report the missile still remained unextracted.

CASE 4. *Gunshot Fracture of Mastoid and Petrous Portions of Left Temporal Bone; Missile lodged and was extracted; Long-continued Suppuration and Exfoliation; Partial Recovery.*—On April 19, 1865, at the Head-quarters of the Army of the Potomac, near Burksville, Va.,

the writer carefully examined Major Wm. T. S., A. D. C., for disability, attended with the following history: This officer was wounded at the Wilderness, May 6, 1864, by a cylindro-conoidal ball, which penetrated the mastoid portion of the *left* temporal bone, passed inward and somewhat forward to the depth of about two inches, and lodged. He was knocked from his horse senseless, and remained unconscious about an hour. The missile was extracted on the field. It was much elongated, and several small splinters of bone were firmly stuck into it. He was taken to the second division hospital of the Second Corps. When he came to himself he was speechless, being unable to articulate a single word, with complete motor paralysis of the *left* side of his face and partial paralysis (hemiplegia) of the *right* side of his body; audition in left ear totally destroyed. He was taken to Washington for treatment, and remained speechless for twenty days. Purulent matter was discharged from the left ear, as well as from the wound, containing numerous small pieces of bone. His mind at times was also considerably impaired. He slowly improved, and in March, 1865, he had so far recovered as to be on duty with Major-General Webb, Chief of Staff to General Meade, commanding the Army of the Potomac. He served actively in the short but brilliant campaign which ended on April 9, at Appomatox, with General Lee's surrender. He was made worse by this service. On April 19, when I examined him, the wound was still open and discharging. The left side of his face was still paralyzed to a considerable extent from lesion of the *portio dura*. He was totally deaf in left ear from lesion of the *portio mollis* and internal ear. He had slight paralysis (hemiplegia) of right half of body from injury of the *motor tract*. He dragged his right foot and toes in walking. He could write, but with much difficulty. He complained of vertigo, and that his memory was much impaired; fatigue always increased his troubles. I advised him to proceed at once to Philadelphia to get treatment from Drs. Weir Mitchell and Morehouse. On January 17, 1880, I again examined this officer. Notwithstanding the best of treatment, his condition, upon the whole, is much worse. He has acquired traumatic epilepsy. His intellect is considerably weakened. The facial palsy continues, and he cannot close his left eyelids. The left eyeball is bare, staring, and somewhat protuberant from paralysis of the ocular muscles. The hemiplegia (right-sided) is attended with considerable atrophy and contraction of the flexor tendons. The sight of his left eye is much impaired; that of his right eye somewhat. He continues totally deaf in left ear. He is subject to neuralgic pains in left side of head, face, and neck. He is much affected by changes of the weather. The wound is still unhealed, and discharges purulent matter mixed, from time to time, with small fragments of bone.

Furthermore, *two* cases published by the writer in the number of this Journal for January, 1880, in an article on "Fractures of the Cranial Bones" (Cases XII. and XIII.), are examples in which the basis of the skull was also broken, and recovery followed. In each of them there was simple fracture of the os frontis, with much displacement. In each of them, too, the fracture extended downward into the eye-socket, and involved the orbital plate of the frontal bone, with, perhaps, still other portions of the anterior cranial fossa.

Thus, it is shown that I am personally acquainted with at least six cases

in which fractures involving the base of the skull were followed by recovery. But I also find, on making suitable inquiry and research, that my experience is, in reality, not exceptional; for, scattered widely through the pages of the first surgical volume of the "Medical and Surgical History of the War of the Rebellion," there are recorded, with more or less minuteness of detail, the histories of more than one hundred and thirty cases which belong to the same category. These cases, however, are not grouped together under one head in that collection, but are reported under many different heads; and it has cost me considerable time and labour, that was not unpleasantly expended, in searching for and preparing to utilize them. Where these cases are now hoarded, they are inaccessible to most members of the profession. They do but little good there, because they are comparatively unknown. But, at the same time, they seem like a new revelation concerning the subject-matter of this article; and they add so much to the domain of human knowledge on this topic, and throw so much light on some other obscure and controverted points in cranial pathology, that, beyond question, they ought to be popularly incorporated with the medical literature of our day, so that they, and the important lessons which they teach, may become known to all.

An appreciation of the simple fact that gunshot and other fractures involving the base of the skull are not hopeless lesions will practically do some good, at least, by causing more attention to be paid to their treatment, especially during the first days after the mishap, whereby better results will be secured, in individual cases, than otherwise would be obtained. And here, it is not improper to state, in a general way, that the "Medical and Surgical History of the War of the Rebellion" contains by far the grandest collection of surgical facts and observations that exists in any language; and that many of these cases and the inductions which they warrant should be published in the medical journals, so that they may be read by, and thus prove useful to, the profession at large.

The following example is reported, in the first surgical volume of the "Medical and Surgical History of the War of the Rebellion," under the head of "Balls lodged within the Cranial Cavity:"—

CASE 5. *Gunshot Fracture of Mastoid Process, etc.; Recovery.*—John W., aged 25, was wounded June 17, 1864, by a conoidal musket-ball, which entered the mastoid process of right temporal bone, and penetrated the brain. On the same day he entered the first division hospital of Fourteenth Corps; on the 26th he was sent to hospital No. 1, at Nashville; on the 29th, he was transferred to the Totten Hospital, at Louisville; and on July 12, he was admitted to the Soldiers' Home Hospital, at Indianapolis. He recovered; and on July 24, 1865, he was discharged from the service. The Pension Examiner, since, reports this patient entirely deaf in right ear, right eye irritable and injected, constant pain in right side of head, mental faculties impaired, with tendency to vertigo upon slight exertion, and rates the disability total and permanent. He also believed that the missile had not been removed (*loc. cit.*, p. 194).

The next example is also reported under the head of "Balls lodged within the Cranial Cavity:"—

CASE 6. *Base of Right Temporal Fractured by a Buckshot; Recovery.*—Wm. A. A. was wounded March 14, 1862, by a buckshot, which entered the right ear back of the meatus, penetrated the bone, and lodged within the cranium. On the 18th, he was admitted to the Academy Hospital, at New Berne; on April 20, he was furloughed; and on October 16, he was discharged from the service, and pensioned. On December 12, the Pension Examiner reports the wound still discharging, and the patient complaining of stiffness in the cords of his neck, with weakness of his right arm and inability to move it for five weeks, except with the assistance of his left hand. He was still weak, but gradually gaining strength. At times he was subject to slight deafness. In a subsequent report, dated October 19, 1866, he states that the missile still remained in the brain, that the wound was discharging pus, and that a sinus was opening back of the ear; that the man's general health was impaired, and that he rated the disability one-half and permanent (*loc. cit.*, p. 194).

The following example is likewise reported under the head of "Balls lodged within the Cranial Cavity":—

CASE 7. *Gunshot Fracture of Occipital at Base of Skull; Recovery.*—Wm. F. W., aged 20, was wounded December 23, 1864, by a conoidal ball which entered the right external ear, passed downward and backward, and lodged, fracturing the occipital bone. He was taken to the post hospital at Columbia, and on January 19, 1865, was sent to hospital No. 2, at Nashville. On July 20, he was transferred to the Crittenden Hospital at Louisville, thence to the Jefferson Hospital, Indiana, and on July 26 to Indianapolis, where he was mustered out of the service on August 26, and pensioned, his disability being rated one-half and probably permanent. The Pension Examiner reported that he suffered pain and vertigo after any active exercise (*loc. cit.*, p. 194).

The next example is also reported under the head of "Balls lodged within the Cranial Cavity":—

CASE 8. *Base of Left Temporal fractured by Gunshot; Recovery.*—John F. L. was wounded by a gunshot missile, probably a buckshot, which entered the mastoid process of left temporal bone close behind the middle of the pinna, passed slightly forward and lodged in the cranium, but its exact locality could not be ascertained. The pinna became adherent to the skin at the orifice of the wound. He suffered pain in the region between the point of entrance and the eyebrow. Active exercise, or stooping, would produce dizziness and pain. The vision and hearing of the left side were slightly impaired. He was discharged from the service on March 14, 1862, and pensioned, his disability being rated one-half and temporary (*loc. cit.*, p. 195).

The next two examples are reported under the head of "Missiles extracted from within the Cranium":—

CASE 9. *Gunshot Fracture involving Base of Temporal; Recovery.*—Wm. E. C. was wounded March 25, 1865, by a conoidal musket-ball which caused a penetrating fracture of the temporal bone. He was, on the same day, admitted to the 1st Division Hospital, Second Corps; thence he was sent to Washington, and placed in Campbell Hospital on the 28th, where the missile was taken out. On May 30, he was discharged. On May 15, 1868, the Pension Examiner reported that, from time to time, pieces of bone have been discharged from his ear; that there was a constant discharge from his ear, with a continued dull pain in his head; and that his jaw was ankylosed. His disability was rated three-fourths and temporary (*loc. cit.*, p. 197).

The protracted discharge of pus and fragments of bone from the ear, and the ankylosed condition of the jaw show conclusively what part of the os temporalis was broken in this instance.

CASE 10. *Gunshot Fracture of Left Orbit; Recovery.*—Andrew G. was wounded July, 1863, by a conoidal ball which struck on the outer side of the left orbit, penetrated behind the left eye and lodged; treated in field and Baltimore hospitals, and at Fort Independence, Boston Harbor. On January 5, 1864, he was discharged from the service. On April 28, the Pension Examiner reported that the ball had been extracted, but the vision of the eye was gone; that the eyeball was lessened one-third in size, and the pupil was insensible to light; that sudden shocks would give great pain in the eye; that there was almost complete loss of memory, and that much pain was felt in the head. His disability was rated total and permanent (*loc. cit.*, p. 197).

CASE 11. *Perforating Fracture of Base of Skull from Gunshot; Recovery.*—Robert E., aged 39, was wounded May 6, 1864, by a conoidal ball, which entered at the occipital bone, and escaped under the right eye; treated in field, Alexandria, Chester, and Philadelphia hospitals. Partial paralysis of lower extremities occurred. On August 29, 1865, he was discharged from the service and pensioned. On Sept 11, 1866, the Pension Examiner reported that his disability then consisted in partial paralysis of both lower extremities, imperfect vision, disturbance of mental faculties, and severe pain in head. In 1867, his disability was rated total and permanent (*loc cit.*, p. 209).

CASE 12. *Gunshot Fracture of Petrous Portion of Right Temporal Bone; Recovery; Not Pensioned.*—R. D. was wounded May 27, 1862, by a musket-ball, which entered above the right zygoma, carried away part of the external ear, fractured the petrous portion of the right temporal and emerged at the base of the occipital bone. He was delirious for one hour after the injury. Small pieces of bone were discharged from the wound, and his mind was impaired. On August 22, he was admitted to the Ladies' Home Hospital, N. Y., where he was discharged from the service on September 23. Afterward, there was occasional pain, and his memory was impaired. He is not a pensioner (*loc. cit.*, p. 187).

CASE 13. *Gunshot Fracture involving Meatus Externus and Mastoid Process of Right Temporal; Recovery; Not Pensioned.*—R. W. H., aged 22, was wounded July 2, 1863, by a conoidal ball which entered anterior to top of right ear, passed backward and downward through the external ear, injured the mastoid process, and emerged at the back of his neck, six inches from the point of entrance. He fell senseless, was carried to the Seminary Hospital, and remained unconscious two days. On August 22, the orifice of entrance was filled with granulations, and that of exit with plastic lymph. The movements of his lower jaw became restricted; he could not raise the right eyebrow, nor close the right eyelids. He suffered much pain on injured side of head; the discharge came principally from the external meatus, whence a piece of bone also came away. On September 13, 1864, he was discharged from the service. He is not a pensioner (*loc. cit.*, p. 188).

CASE 14. *Gunshot Fracture of Mastoid Portion of Left Temporal; Complete Recovery.*—Wm. G. C., aged 21, was wounded on July 2, 1863, by a conoidal ball, which struck his head just behind the left mastoid process, passed upward and inward, and lodged in a depression of the skull. Also, he received flesh-wounds of scalp and left shoulder; treated in Seminary and York Hospitals. He stated that he became senseless, and remained so five days; and that he could not speak for nine days. Spiculae of bone and the ball were removed, and cold water dressings applied, after which he improved rapidly. On August 24, the wound had filled with healthy granulations. A marked depression in the skull behind the mastoid process could be felt. Appetite, assimilation, and secretion were good, but headache recurred about three hours each afternoon. During September, he suffered from erysipelas of the face, but he recovered, and was returned to duty January 15, 1864. He is not a pensioner (*loc. cit.*, p. 215).

CASE 15. *Gunshot Fracture involving Left Ear and Mastoid Process; Recovered and returned to duty.*—Richard R. (coloured) was wounded February 20, 1864, by a conoidal musket-ball, which entered the left ear and passed through the mastoid process. On the 26th he was sent to the hospital at Beaufort, at which time there was some discharge from the ear and pain in the head, with obstinate constipation. He was treated expectantly, and by March 31 there was

marked improvement. On July 10, he was returned to duty, though still deaf (*loc. cit.*, p. 179).

It is believed that the last four patients recovered so completely as not to need assistance from pension or otherwise.

CASE 16. Gunshot Fracture involving Right Ear and Mastoid Process; Complete Recovery.—Philip G., aged 20, was wounded May 19, 1863, by a musket-ball which passed through the right ear and fractured the mastoid process; treated in field and Mound City Hospitals. On July 28, he was suffering from vertigo and headache, and the wound was still discharging. On August 21, a piece of necrosed bone, one-fourth of an inch in diameter and one-eighth of an inch in thickness, was removed. He gradually improved, and, by the 30th, the wound was entirely healed. He also had intermittent fever, which soon subsided. He was placed on duty as nurse, and acted in that capacity until April 25, 1865, when he was returned to duty. He is not a pensioner (*loc. cit.*, p. 216).

CASE 17. Shell Fracture of Basis Cranii; Complete Recovery.—Thomas T. B., aged 24, wounded September 20, 1863; fracture of skull below and to the left of the occipital protuberance by shell; treated in Confederate hospitals at Ringgold and Richmond; paroled March 6, 1864, and admitted to hospital at Annapolis Junction; ten fragments of bone removed; discharged from the service September 20, 1864. He is not a pensioner (*loc. cit.*, p. 243).

CASE 18. Gunshot Fracture of Left Temporal at its Base; Complete Recovery.—G. S., aged 25, a conoidal ball entered just in front of the external meatus of left ear and lodged, probably in petrous portion of os temporalis, on August 29, 1862. No treatment until May 11, 1864, when he was admitted to the Columbian Hospital at Washington. An ineffectual attempt to extract the ball was afterwards made in Philadelphia. He was discharged from the service on June 16, 1865. He is not a pensioner (*loc. cit.*, p. 192).

It is believed that the last three patients also recovered so completely as not to need assistance from pension or otherwise.

CASE 19. Gunshot Fracture of the Basis Occipitalis; Recovery.—C. E. T., aged 29, wounded April 2, 1865, by a conoidal musket-ball which struck behind the right ear, fractured the occipital bone, and lodged in the neck, where it was afterwards found and extracted; wounded also in right foot; treated in field and Alexandria Hospitals. On July 17, he was mustered out and pensioned. On January 17, 1870, the Pension Examiner reports that the wound in his head often inflames and suppurates, and that dead pieces of bone exfoliate. He was also subject to cephalalgia, and his memory was greatly impaired (*loc. cit.*, p. 189).

CASE 20. Perforating Fracture of Mastoid Portion of Left Temporal and Occipital Bones; Recovery.—James R. G., aged 37, wounded April 6, 1865, by a conoidal ball which entered the left ear and mastoid process of os temporalis, passed obliquely backward through left hemisphere of cerebrum, and emerged at the centre of the occiput; treated in field and Washington Hospitals. Simple dressings only were applied to the wound. On July 15, he was discharged from the service, with total deafness of the left ear, and pensioned, his disability being rated total and temporary (*loc. cit.*, p. 209).

CASE 21. Gunshot Fracture, involving the Basis of the Occipital, etc.; Recovery.—Lewis K., aged 44, Chancellorsville, May 3, 1863. Fracture of occipital bone by a conoidal ball, which lodged beneath the mastoid process in sterno-mastoid muscle. Treated at Washington, and discharged November 7, 1863. The Pension Examiner reports on November 9, 1863, that the missile has not been extracted, and it is the cause of constant irritation and stiffness of the neck. On March 6, 1867, the Pension Examiner states there is vertigo, dimness of vision, and pain in head, and that the power of locomotion is somewhat interfered with (*loc. cit.*, p. 310).

CASE 22. Gunshot Fracture, involving the Base of the Occipital; Recovery.—Captain Frank G., aged 30, wounded May 8, 1864, by a conoidal musket-ball, which fractured the occipital bone at the protuberance; the fracture extended one inch and seven-eighths by one inch in width where widest; treated in field,

Alexandria, and Annapolis Hospitals; fragments of bone were removed, and ice applied. On June 15, several pieces of dead bone were extracted, followed by hemorrhage; the orifice was kept open by sponge-tents. In July, leave of absence was granted. On October 7 he was discharged from the service, and pensioned. On February 18, 1865, the Pension Examiner reported that there was partial paralysis of the optic nerve of both eyes, the right being most affected. Exertion caused pain in head and vertigo (*loc. cit.*, p. 233).

CASE 23. *Gunshot Fracture of Left Temporal at its Base; Recovered, and re-enlisted.*—Alexander J. C. was wounded June 30, 1862. The missile entered behind the left ear, and injured the mastoid process of the temporal bone; treated in field and Point Lookout hospitals; discharged from the service and pensioned on December 25. The wound had healed with an irregular cicatrix, and the hearing was somewhat affected. He re-enlisted on February 8, 1864, and was mustered out on June 26, 1865. The Pension Examiner reported, on July 31, 1866, that his hearing was affected, and there was a purulent discharge from the ear, and pain in its vicinity (*loc. cit.*, p. 131).

CASE 24. *Gunshot Fracture of Squamous and Petrous Portions of Left Temporal; Recovery*—Dominiek B., aged 31, was wounded December 14, 1864, by a conoidal ball, which caused a penetrating fracture of the petrous and squamous portions of the left os temporalis; treated in field, Murfreesboro, Nashville, and Jefferson Barracks hospitals, where the case progressed favourably. On May 21, 1865, he was discharged from the service. On March 29, 1866, the Pension Examiner reported that exfoliation was still going on. The sinus immediately above the meatus was constantly discharging matter, as well as the meatus itself. The hearing on that side was completely destroyed. The mind was much impaired. He rated the disability total and temporary (*loc. cit.*, p. 187).

CASE 25. *Gunshot Fracture of Right Bony Ear; Missile lodged and not extracted; Recovery.*—Ellroy C., aged 23, admitted to hospital April 8, 1863, for gunshot wound of head. The missile entered just in front of right ear, and lodged in the meatus externus. When admitted, there was free purulent discharge from meatus; and deep therein a mass of florid granulations, supposed to cover the seat of a rifle-ball; deafness marked, but not complete; in front of corresponding tragus was the scar of a gunshot wound. The meatus was kept clean, and solution of argentic nitrate applied to the granulations. On May 9, the patient being under chloroform, two small pieces of carious bone were removed from a mass blocking up the canal. The meatus was freely incised, and a plug of sponge introduced. On the 20th he was discharged from the service. On August 4, 1863, the Pension Examiner reported that there was a ball lodged in his right temporal bone, causing necrosis and loss of hearing (*loc. cit.*, p. 234).

CASE 26. *Gunshot Fracture, involving Petrous portion, etc., of Right Temporal; Recovery.*—William F., wounded July 12, 1864, by a conoidal ball; on the following day he entered Mount Pleasant Hospital. A little above right ear was a scalp wound an inch and a half long. A fracture was diagnosed that extended into the petrous portion of temporal bone, and chipped off a piece of the mastoid process. The patient did well with simple dressings, rest, and gentle cathartics, till the 20th, when the wound was attacked with gangrene. On August 9, the slough separated, leaving a space five inches in diameter denuded of integument, fascia, and muscles. The denuded bone necrosed, and, on September 6, a fragment of the squamous portion of temporal was removed. Two days later other fragments were detached and extracted. Then the wound began to cicatrize rapidly. On December 3, the patient was reported to be nearly well. On February 14, 1865, he was discharged from the service, and pensioned. The necrosed bone is preserved in the Army Medical Museum, and figured in the "Medical and Surgical History of the War" (*loc. cit.*, p. 188). He was reported to be partially deaf.

CASE 27. *Gunshot Fracture of Petrous Bone; Hemorrhage arrested by Tying the Common Carotid; Recovery.*—J. S. H. was wounded February 14, 1862, by a musket-ball which struck the left ear, carried away the antitragus, perforated the temporal bone, and escaped at the masseter on right side, dividing Steno's duct. He was sent to the Third Street Hospital at Cincinnati, where, on March

2, during an effort to remove fragments of the petrous bone, there was copious hemorrhage, which was treated, but not arrested, by the free employment of persulphate of iron. Hemorrhage occurred on the 8th; on the 22d, the carotid was tied, under chloroform; ligature came away on the twelfth day. The patient rapidly regained his strength; and, on July 23, was discharged convalescent. He was last heard from in 1868. He had facial paralysis (*loc. cit.*, p. 313).

In this case the missile passed almost transversely from left to right, and must have extensively shattered the base of the skull. It seems truly wonderful that the man did not die on the spot when struck. The case is also valuable as showing the utility of tying the common carotid for hemorrhage from the meningeal arteries. The following example belongs to the same category:—

CASE 28. *Shell Fracture in Left Temporal Region, which probably extended into the Basis of Cranium; Hemorrhage from Middle Meningeal Artery; Deligation of Left Common Carotid; Recovery.*—Wm. C. A., aged 19, was wounded by a fragment of shell in the left temporal region, December 28, 1862; treated in field and St Louis hospitals. On January 18, hemorrhage, amounting to twelve ounces, occurred from the middle meningeal artery, which, all other means failing, was arrested by tying the left common carotid artery, and did not recur. On May 28, 1863, he was discharged from the service. In March, 1868, he was a pensioner, his disability being rated total and temporary. The Pension Examiner reported that he had dizziness and faintness on exertion or stooping, partial anæsthesia of the left side of his face, and was compelled to keep his room in the cold winters of Madison, Iowa, from liability to freeze the left ear and side of face. He was known to be still in tolerable health on June 4, 1872, almost ten years after the casualty and the operation (*loc. cit.*, p. 314).

The last two cases, then, aside from fracture of the basis cranii, are very important, inasmuch as they serve to illustrate the principle of arresting an outflow of blood from the middle meningeal artery, when wounded, by tying the common carotid.

CASE 29. *Perforating Fracture of Cranial Base from Gunshot; Recovery.*—John F. L., aged 21, was wounded August 11, 1864, by a conoidal musket-ball, which caused a perforating fracture of the base of the skull. He was treated in field and Keokuk hospitals. Simple dressings only were applied to the wound. On August 25, 1865, he was discharged from the service and pensioned. There was partial hemiplegia of right side, and the disability was rated total (*loc. cit.*, p. 208).

CASE 30. *Perforating Fracture involving Base of Skull; Recovery.*—H. E., aged 23, was wounded September 19, 1863, by a conoidal ball which entered at a point one-fourth of an inch behind left ear, and just in front of the lower part of mastoid process, opened the meatus, and emerged from the forehead at a point two inches above outer canthus, and one inch above superciliary ridge of left eye. Treated in field, Chattanooga, Bridgeport, Cumberland, Louisville, and Jeffersonville hospitals. Some small spiculae of bone were removed from the upper orifice. No unfavourable symptoms appeared. On February 29, 1864, he was returned to duty. On August 31, 1865, he was discharged from the service and pensioned. In October, 1867, the Pension Examiner reported that there was total loss of hearing in left ear, and of sight in left eye, and that there was mental imbecility unfitting him for business pursuits and for manual labour (*loc. cit.*, pp. 233, 234).

CASE 31. *Gunshot Fracture of Mastoid Process, etc.; Returned to duty.*—R. W. W. was wounded December 13, 1862, by a conoidal musket-ball which passed from behind forward through the right mastoid process and concha. Treated in field and Washington hospitals. He recovered, except from the

deafness of right ear, and, on April 11, 1863, was returned to duty (*loc. cit.*, p. 180).

CASE 32. *Gunshot Fracture involving Internal Ear; Recovery.*—Wm. B. H. was wounded May 3, 1863. The missile entered in front of the external meatus, and lodged in the internal ear. Treated in field, Washington, and Philadelphia hospitals. He was discharged from the service on April 6, 1865, and pensioned. The ball remained in the wound, and could be felt in its place of lodgment. The sense of hearing was completely lost in injured ear. The sense of taste was also lost, and he suffered from vertigo (*loc. cit.*, p. 180).

CASE 33. *Perforating Fracture beneath Left Cerebral Hemisphere; Recovery.*—Eugene P., aged 23, was wounded June 16, 1864, by a conoidal musket-ball which entered at the inner angle of left eye, passed through the brain, and emerged behind the left ear. Treated in field, Rhode Island, and Albany hospitals. The treatment consisted chiefly in dressing the wound, which had cicatrized by December 22. His general health being good at that date, he was discharged from the service and pensioned, the vision of his right eye being obscured. On March 7, 1867, the Pension Examiner reported that there was a discharge of pus from the orifice of entrance, and through the right nostril and upper part of posterior nasal cavity into the mouth. There was constant headache; he could not stoop without becoming dizzy, and his eyesight was imperfect. At night, pus ran into his mouth so that he was often obliged to rise and cleanse his throat in order to sleep. His disability is rated total and permanent (*loc. cit.*, p. 209).

CASE 34. *Perforating Fracture involving Base of Left Temporal, etc.; Recovery.*—Charles B. was wounded May 5, 1862, by a musket-ball which entered the left side of his head, passed through the zygoma, and emerged at the mastoid process of the temporal bone. On the 10th he was admitted to General Hospital at Baltimore. Four fragments were removed from the squamous portion of left temporal, the largest measuring one-fourth by one inch. He improved rapidly, and, on August 6, was discharged from the service, having recovered with paralysis of the parts supplied by the left *portio dura*. On April 25, 1865, the Pension Examiner states that the sight of his left eye and the hearing of his left ear are destroyed, and that twenty-eight pieces of bone have been discharged from the wound. In August, 1869, he was a pensioner, his disability being rated at one-half (*loc. cit.*, p. 233).

CASE 35. *Gunshot Fracture involving Base of Skull; Recovery.*—Sergeant A. R. was wounded Sept. 14, 1862, by a conoidal ball, which entered the left side of face at base of nose, passed obliquely backward, and emerged behind the right ear, separating the mastoid process of temporal bone. He became insensible. There was bleeding from mouth, ear, and eye for several hours after consciousness returned; treated in field, Washington, and New York hospitals. The motor oculi, the trigeminus, the *portio dura*, and other nerves on right side were paralyzed. There was loss of vision of right eye and of sensation and mobility of right side of face. He was unable to swallow or open his mouth. Febrile action set in, which, together with headache and profuse suppuration of wound rapidly reduced his strength. He quickly became weak, pale, and emaciated; skin moist, appetite poor; pulse regular, slow, and compressible. The right eye was lachrymose, and the mouth drawn toward left ear. The face-wound healed, but the head-wound continued to discharge pus profusely. On March 21, 1863, he was discharged from the service, his disability being rated at one-half (*loc. cit.*, p. 165).

CASE 36. *Gunshot Fracture involving Mastoid Portion of Left Temporal; Recovery.*—James H. Q., aged 21, was wounded May 19, 1864, by a conoidal musket-ball which penetrated the outer table of left temporal bone, passed downwards and chipped off a portion of the mastoid process. He remained on the field three days without attendance; was then removed to Fredericksburg, and subsequently treated in Washington and Maine hospitals. Another wound involved his axilla. Simple dressings were used. On July 23d, a piece of the outer table of temporal, about three-fourths by one-half inch in size, was removed. Afterward, the patient slowly recovered. On Feb. 18, 1865, he was transferred to the Veteran Reserve Corps. On June 10, he was discharged from the ser-

vice, and pensioned. The wound had healed, but active exercise caused dyspnoea. Subsequently the Pension Examiner states that he suffered from deafness, headache, vertigo, paralysis of arm, and inability to bear exposure to heat; disability rated total and permanent (*loc. cit.*, p. 227).

CASE 37. Gunshot Fracture involving Mastoid Portion of Right Temporal; Recovery.—George S., wounded May 3, 1863, by a conoidal ball which fractured the mastoid portion of right temporal bone. On the 5th, fragments of bone were extracted at a field hospital. On the 26th, he was sent to Alexandria; and on Sept. 16th, returned to duty. On August 26, 1864, he was discharged from the service, and pensioned. His pension was increased in September, 1867, reduced in September, 1869; and, in March, 1870, he applied for an increase of pension, claiming that his disability had increased. The Pension Examiner certified that there was a depression in the mastoid portion of os temporalis, that he complained of neuralgic pains in the right side of head, and of deafness of right ear; but after several weeks of observation the Examiner did not recommend any increase over his present rate of three-fourths disability (*loc. cit.*, p. 233).

CASE 38. Gunshot Fracture involving Mastoid Portion of Left Temporal; Recovery.—Lieut. Isaac B., aged 28, was wounded Sept. 14, 1862, by a round musket-ball, which entered the mastoid portion of left temporal bone, about one and a half inches above and behind the meatus, and lodged. After a few minutes of insensibility, he attempted to rise, but being unable to control his limbs he would stumble constantly and fall. He states that he introduced his little finger more than an inch into the wound, and could feel the brain substance. Spiculæ of bone were removed; treated in field, Frederick, Washington, and New York hospitals. Simple dressings were applied. For several weeks he staggered, and had fever, but never delirium. Spiculæ of bone continued to come away for some weeks, but the wound gradually healed. He returned to his regiment, and on October 26, 1864, was mustered out. On March 29, 1866, he was examined. A prominent scar marked the spot where the ball entered, which, as he believed, still remained in the cranium. He was subject to pain in the back part of head. His intellect did not seem to be impaired. On Oct. 7, 1867, the Pension Examiner reported him as nearly unfit for any business, owing to vertigo, headache, and dizziness, and rated his disability as total and permanent (*loc. cit.*, p. 225).

CASE 39. Gunshot Fracture involving Mastoid Process of Temporal, and Base of Occipital; Recovery.—Capt. Winfield S. B., aged 23, was wounded Aug. 16, 1864, by a conoidal ball which fractured the mastoid process of the temporal bone and injured the base of the occipital; treated in field, and Philadelphia hospitals. On the 20th, he was delirious, and the wound had an unhealthy aspect. On the 23d, hemorrhage to the amount of eight ounces occurred from the posterior auricular and some of the small deep cervical branches; it was arrested with styptics, compress, and roller. On the following day it recurred, and about five ounces were lost. Afterwards the case progressed favourably. On December 7, several spiculæ of necrosed bone came away, and, on the 30th, a large portion of the mastoid process was removed. In January, he was mustered out of the service. On May 15, 1865, he was a pensioner, his disability being rated total and permanent (*loc. cit.*, p. 224).

CASE 40. Perforating Fracture of the Mastoid Portion of both Temporals; Recovery.—Lieut. W. H. C., aged 22 (Confederate), was wounded Sept. 1, 1864, by a conoidal musket-ball, which entered the cranium one inch above the mastoid process, and emerged on the opposite side, where the presence of cerebral matter left no doubt that the brain was injured. On the next day he was taken to a field hospital, perfectly unconscious, with stertorous breathing. Toward evening, he became conscious and restless, complaining of loss of vision, and inability to raise his head. Toward midnight, he began to scream, and for three weeks did so incessantly, even during sleep. On the 20th, he suddenly became quiet, and answered questions coherently. The left side seemed paralyzed, as he could not use that hand or leg; face drawn to the right, and there was some difficulty in swallowing; secretions natural. He had constant priapism with seminal emissions. He rapidly improved, but he seemed unable to guide his movements, and the power of his will over motion seemed lost. Several spiculæ of

bone came away. About the seventh week, all discharge from the wound had ceased. His left pupil seemed permanently dilated and intolerant of light. On December 8, he was sent to the Provost Marshal for exchange (*loc. cit.*, pp. 208, 209).

This case is reported in the "Medical and Surgical History of the War of the Rebellion," under the head of "Perforating Gunshot Fractures of the Skull." The next case belongs to the same category.

CASE 41. *Perforating Fracture of Basis Cranii from Gunshot; Recovery.*—Charles C. T. (Confederate), aged 17, was wounded Aug. 30, 1864, by a ball which entered the forehead just above the *left* eye, and emerged behind the *right* ear. He was retired by an examining board on January 3, 1865. The vision of both eyes was affected, and he was permanently disabled (*loc. cit.*, p. 208).

In this case the missile passed obliquely downward and backward from left to right through the os frontis and the cranial base. It is almost wonderful that he did not die on the spot when he was struck.

CASE 42. *Gunshot Fracture of Left Temporal at its Base; Recovery.*—Albert W. B., aged 22, was wounded Aug. 17, 1864, by a conoidal musket-ball which entered the left side of head, two inches in front of ear, and emerged one inch and a half behind ear, fracturing the mastoid portion of temporal bone, etc.; treated in field, Chattanooga, Jeffersonville, St. Louis, and Wisconsin hospitals. Several pieces of the mastoid process were removed. On May 23, 1865, he was mustered out of the service. In 1868, he was a pensioner at four dollars per month, his disability being rated at one-half and temporary. Afterwards, his pension was increased to fifteen dollars per month, the Pension Examiner having certified as follows: "The wound leaves him with complete loss of hearing, taste, and smell on left side, with partial blindness of left eye from retinitis; also with paralysis of all the facial muscles on left side, inability to close the left eyelids, and tenderness of eyeball. The condition of the brain induces vertigo and unsteadiness of gait. He cannot stoop for many moments without complete syncope. The deformity is very considerable, causing an appearance of imbecility when seen from the injured side. So far as known, his habits are good. The disability seems permanent in character, and, in my opinion, is total" (*loc. cit.*, pp. 234, 235).

CASE 43. *Gunshot Fracture involving Right Malar and Temporal Bones; Recovery.*—Isaac P. B., aged 24, was wounded, April 7, 1862, by a missile which passed through the right malar and temporal bones. The case progressed finely. He was treated at City Hospital, St. Louis, and at Camp Dennison, where he was discharged from the service, Aug. 14, 1862. He re-enlisted July 18, 1863, and on January 18, 1865, was again discharged and pensioned. In May, 1865, there was partial paralysis of the right side of face, and deafness of the right ear; his disability was rated one-half and permanent (*loc. cit.*, p. 189).

In this case the projectile passed also through the basis of the cranium. Nevertheless, the man recovered so far as to be accepted on re-enlistment.

CASE 44. *Gunshot Fracture involving the Base of Skull; Recovery; Not Pensioned.*—Lieutenant-Colonel H. A. F. was, on January 15, 1863, admitted to the Officers' Hospital at Philadelphia, with a gunshot fracture of the occipital bone at its protuberance. A portion of the outer table was necrosed and came away. There were symptoms of compression, but the wound was nearly healed, and the discharge was very slight. On April 1, a piece of bone, the size of a finger-nail and one-sixteenth of an inch thick, was removed from the outer table. No further complication occurred, and he returned to duty in the same month. He is not a pensioner (*loc. cit.*, p. 216).

It is hoped that this officer recovered so completely as not to require the assistance of a pension.

CASE 45. *Gunshot Fracture of Left Mastoid Process; Recovery.*—George H. M. was wounded Aug. 30, 1862, by a musket-ball which entered behind the mastoid process of *left* temporal bone, fracturing a part thereof, passed obliquely forward, and emerged just exterior to the right ala nasi; treated in hospital at Alexandria. The muscles of the lower jaw were rigid, and splinters of the mastoid process were discharged from time to time. On Oct. 23, he was discharged from the service; wound then not entirely healed. On March 6, 1867, the Pension Examiner reported that the left lachrymo-nasal duct was closed, the sac constantly becoming distended with secretion; that there was hyperæsthesia of left side of face; and that the patient could not bear exposure to cold without much suffering. In March, 1868, his disability was rated at one-half and permanent (*loc. cit.*, p. 172).

CASE 46. *Gunshot Wound of Head; Direct Fracture of Basis Cranii; Recovery.*—Andrew W., aged 35, was wounded May 14, 1864, by a conoidal ball which entered near the lambdoidal suture, and emerged in front of, and below the left ear, having passed through the base of the skull. He was discharged from the service June 26, 1865, and pensioned. The hearing of his left ear was destroyed, the muscles of left side of face were paralyzed, and he was unable to close his left eye, the sight of which was also affected. His disability was rated total and temporary (*loc. cit.*, p. 172).

CASE 47. *Gunshot Fracture involving Basis of Right Temporal; Recovery.*—Walter W., aged 37, was wounded April 1, 1865, by a conoidal ball which entered above the anterior zygomatic articulation, fractured and depressed the temporal bone, and emerged just above the right meatus; treated in field and Washington hospitals. On the 22d he had slight hemorrhage from the common temporal, which was ligated. The wounds of entrance and exit were connected, when it was found that a small portion of bone at the point of exit was denuded of pericranium. Subsequently, the denuded portion was removed. By June 17th, he had fully recovered; and on the 29th, he was discharged from the service. In July, 1868, he was a pensioner, his disability being rated total and permanent (*loc. cit.*, pp. 225, 226).

CASE 48. *Gunshot Fracture involving Base of Frontal, Sphenoid, and Ethmoid; Recovery.*—Sergt. J. C., aged 20, was wounded July 2, 1863, by a conoidal ball which entered just behind the outer angle of the *right* eye, passed through the orbital plate and the great wing of sphenoid, and emerged at a corresponding point behind *left* eye, having torn away nearly all the orbital plate; orifice of exit fully one inch and a half in diameter; that of entrance about half an inch. On the 8th, he was transferred to the Satterlee Hospital at Philadelphia. The tunics of right eye were hanging out and much tumefied, about as large as a black walnut, and sloughing. The left eye was shrunken, its humours evacuated, and its tunics slightly inflamed. The missile passed apparently beneath the cribriform plate of the ethmoid, destroying a portion of the latter with the lachrymal bones, and severing the optic nerves; profuse discharge of pus from both wounds; sense of smell as well as sight entirely destroyed. Patient in a tolerably good condition, but restless; appetite moderate, tongue slightly furred, and pulse about 90. Flaxseed dressings applied. On the 10th, the external angular process of frontal bone was extracted from wound of entrance; also several small spiculæ. On the 13th, a small fragment of the great wing of the left sphenoid was removed. On the 17th, the slough came away from right eye. No symptoms of cerebral disturbance had appeared. On the 19th, there was considerable œdema of left eye, and more inflammation. On the 21st, a thin plate of bone was discharged from the nose, apparently a piece of the perpendicular plate of the ethmoid. On the 25th, another small piece of bone came away from the left wound; discharge still profuse, but wounds granulating finely. Night sweats occurring, quinia and sulphuric acid were given. On Aug. 8, the wound of entrance had healed; that of exit was rapidly closing. On Sept. 22, 1864, he was discharged from the service and pensioned (*loc. cit.*, p. 326).

CASE 49. *Gunshot Fracture involving Base of Frontal and Sphenoid Bones; Recovery; Death 4½ years afterwards from Phthisis Pulmonalis.*—Wm. B., aged 24, was wounded June 2, 1864, by a conoidal ball which entered the right temple two inches from the orbit, and, passing obliquely forward and inward,

emerged through the right eyeball; treated in field, Washington, and Philadelphia hospitals. On June 28, 1865, he was discharged from the service. The right eye was destroyed, and the sight of the left one was lost. In March, 1868, he was a pensioner at twenty-five dollars per month. On Jan. 27, 1869, he died of phthisis pulmonalis, being totally blind at the time of death (*loc. cit.*, p. 326).

The last two cases are reported under the head of "Gunshot Wounds of the Orbital Region." The next case is reported under the head of "Exfoliations after Depressed Gunshot Fractures of the Skull":—

CASE 50. *Gunshot Wound involving Face and Base of Skull; Recovery.*—Charles E. P., aged 19, was wounded June 1, 1864, by a gunshot missile which entered the face and emerged behind the ear, probably traversing the meatus in its course. He was taken prisoner and carried to Richmond. By July 31, the temporal bone had become partially exposed, some fragments thereof had escaped, and the sense of hearing was destroyed. Excepting an occasional pain in ear, patient was doing well. He was paroled afterward. On June 29, 1865, he was discharged from the service and pensioned. On Aug. 31, the Pension Examiner reported that there was a purulent discharge from the wound. On the 28th, a piece of bone came away, over an inch in length, making in all that had come out of the jaw and ear, in consequence of the wound and gangrene, twelve pieces. There is total loss of external ear, which, with the paralysis, causes great deformity (*loc. cit.*, p. 187).

The following case is reported under the head of "Perforating Gunshot Fractures of the Skull":—

CASE 51. *Perforating Fracture involving Base of Skull, etc., from Gunshot; Recovery.*—Hugh C. was wounded Sept. 17, 1862, by a conoidal ball which entered the cranium just above the *right* eye, and lodged in the *left* side of neck four inches below left ear. The missile was extracted. On Oct. 8, he was admitted to hospital at Smoketown. On Dec. 20, he was discharged from the service. On Feb. 18, 1863, he was examined for pension. Partial amaurosis of both eyes existed; otherwise he had good health. Subsequent information states that he was unable to work and that his sight was impaired. His disability is rated total and permanent (*loc. cit.*, p. 208).

In this case the missile passed obliquely downward and backward, between the orbits, but injuring both optic nerves in such a way as to produce permanent amblyopia.

CASE 52. *Gunshot Fracture of the Basis of Left Temporal; Recovery.*—L. W. E., aged 26. New Market, Va., May 15, 1864. Fracture of left mastoid process by musket-ball. Treated at Frederick, Baltimore, and Elmira. Transferred to Veteran Reserved Corps, Jan. 3, 1865; discharged July 24, 1865. The Pension Examiner states on April 23, 1868, that he is deprived of the sense of hearing in left ear, and of the power to close the left eyelids, and the muscles of the left side of his face, generally, are paralyzed (*loc. cit.*, p. 310).

In this case the internal ear and the portio dura of left side were also involved in the gunshot lesion.

CASE 53. *Gunshot Fracture involving the Base of Os Frontis, etc.; Recovery.*—Lieut. Isaac N. M., aged 23, was wounded May 19, 1864, by a conoidal ball which entered above the inner angle of right eye, fractured the supra-orbital ridge, and lodged in front of the right ear. The ball and a portion of the supra-orbital ridge were removed; treated at Georgetown and Annapolis. On Aug. 15, he was discharged from the service, and, afterwards, pensioned. On Sept. 15, 1865, the Pension Examiner reports that he has much pain in the forehead, that any exposure to the heat of the sun, or exercise, causes giddiness, with severe pain in the other eye, and dimness of vision; and rates the disability as total (*loc. cit.*, p. 232).

The next example is of much importance because the lesion resulted from a blow over the left eye :—

CASE 54. *Base of Os Frontis Fractured by a Blow; Orbital Roof, etc., Depressed; Recovery.*—James W. was admitted to the Balfour Hospital at Portsmouth on April 10, 1865, with compression of the brain resulting from a fracture of the frontal bone caused by a blow over the left superciliary ridge, received a few hours before admission. The roof of the orbit was depressed, as well as the lower part of the skull. An operation was deemed inexpedient. Cold applications to the head, blisters to the nape of the neck, and stimulants, constituted the treatment (*loc. cit.*, p. 50).

The last case is reported under the head of “Fractures of the Cranium by Blows from various Blunt Weapons,” and bears a strong resemblance to two of the writer’s cases which were mentioned in the forepart of this article.

CASE 55. *Gunshot Fracture of Right Orbital Plate of Os Frontis, etc.; Recovery.*—Abram D. M., aged 21, was wounded Aug. 28, 1864, by a conoidal musket-ball which penetrated the frontal bone just above the right eye, and, passing downward through the orbit, emerged near the right ear; treated in Sandy Hook, Baltimore, and Philadelphia hospitals. The treatment seems to have been of a general character. He recovered, and, on Feb. 13, 1865, was transferred to the Veteran Reserve Corps. He is not a pensioner (*loc. cit.*, p. 208).

It is hoped that this man’s recovery was so complete that he did not need a pension.

CASE 56. *Shell Fracture of Orbital Ridge, Orbital Plate, etc.; Recovery.*—Adam C., aged 21, was wounded June 1, 1864, by a piece of shell which struck the outer angle of the orbital ridge, fractured the orbital plate of os frontis, and partially destroyed right eye; treated in field, Alexandria, and Philadelphia hospitals. On the 28th, two pieces of the orbital ridge were removed; patient’s general condition at this time excellent, but there was some cerebral irritation. On July 1, an incision in the scalp was made, and two pieces of bone removed; one the size of a filbert, the other as large as a pea. Simple antiphlogistic treatment was employed, and the patient progressed finely. On April 13, 1865, he was discharged from the service by reason of loss of sight of the right eye. On March 26, 1868, he was a pensioner, his disability being rated at one-half and permanent. The vision of his right eye was totally destroyed, while that of his left eye was not affected (*loc. cit.*, p. 230).

This man also made a very good recovery, under simple antiphlogistic treatment; and it should here be stated that the patients belonging to this category who were treated antiphlogistically generally made the best recoveries.

CASE 57. *Gunshot Fracture involving Anterior Cranial Fossa; Recovery.*—John T. C., aged 24, was wounded April 2, 1865, by a conoidal ball which entered just above the left zygoma, crossed the left orbit, and emerged through the outer and upper part of the right orbit, destroying both eyes. On May 26, the wound of entrance was already healed, and his general health was good, but lying on the left side would cause headache. The sense of smell, as well as that of sight, was entirely destroyed. Cold-water dressings were applied, and small pieces of bone were taken from the wound of entrance. On June 12, he was discharged from the service and pensioned at twenty-five dollars per month (*loc. cit.*, p. 327).

CASE 58. *Gunshot Fracture involving Anterior Cranial Fossa; Recovery.*—Calvin F. (Confederate), aged 18, was wounded May 31, 1864, by a conoidal ball which entered one inch above the left zygoma, passed through the left orbit, destroying the eye, and emerged from the inner wall of right orbit carrying with it the right eye. On June 10, he was transferred to the Lincoln Hospital at Washington, in

a delirious condition. Erysipelas had attacked the wound and he suffered considerably. Simple dressings were applied. Tonics were administered. The wound gradually healed. There was a loss of the senses of taste and smell as well as of sight; but that of taste became almost entirely restored. On Oct. 1, he was transferred to the Old Capitol Prison for exchange (*loc. cit.*, pp. 243, 244).

In the last two cases the ethmoid bone was also broken, the result of which was that the sense of smell was completely destroyed.

CASE 59. *Gunshot Fracture involving the Base of Os Frontis; Recovery.*—Samuel B., aged 17, was wounded August 30, 1862, by a projectile which entered the frontal bone a little to the right of the median line one inch above the nasal eminence, and emerged at the external angular process (right). He was admitted to the Episcopal Hospital at Philadelphia on Dec. 16. There was a discharge of pus from the loose tissue of the upper eyelid, and from the wound of entrance, which was still open. Pieces of bone had been discharged therefrom at different times before his admission. The wound of exit had closed and the opening formed for the escape of pus was filled with a mass of granulations. The sight of the right eye was dim. On the 20th, another piece of bone escaped from the wound of entrance, which afterwards closed. On March 11, 1863, he was discharged from the service and pensioned. Subsequently, the Pension Examiner reports that exfoliation has followed with great injury to right eye and ear. His disability is rated at three-fourths and doubtful (*loc. cit.*, p. 187).

CASE 60. *Gunshot Fracture of the Base of Os Frontis; Left Eyeball Wounded; Recovery.*—George G., aged 24, was wounded Oct. 19, 1864. The ball passed through upper lid of left eye, penetrated the orbital plate and lodged, evacuating the humours of the globe. On the 23d he was sent to Satterlee Hospital. Diet strictly attended to and room darkened. No attempt made to find the ball. Pulse decidedly cerebral, slow, and irregular. Erysipelas supervened. In the forepart of November he complained of pain and twitchings in his feet, and of occasional headache. Toward the end of November he began to improve, and was discharged from the service on January 7, 1865, to all appearances well. The Pension Commissioner stated, in July, 1868, that he was pensioned at eight dollars per month, his disability being rated total and permanent (*loc. cit.*, p. 330).

CASE 61. *Gunshot Fracture of Right Mastoid Process, Basis Cranii, and Left Orbit; Recovery.*—James N., aged 28, was wounded Sept. 20, 1862. A conoidal musket-ball entered the mastoid process of right temporal, and emerged at the outer canthus of left eye, destroying the organ and tearing the lower lid. Treated in field, Philadelphia, and Germantown hospitals. Becoming subject to fainting fits, epileptiform in character, potassium bromide was administered, and in a few weeks they ceased. On May 12, 1864, he was transferred to the Veteran Reserve Corps. In November, 1867, he was able to follow his usual occupation of carpet-weaving (*loc. cit.*, p. 331). Thus his recovery appears to have been almost complete.

CASE 62. *Gunshot Fracture of the Base of Left Temporal, Frontal, and Ethmoid Bones; Recovery.*—John H. S., aged 24, wounded July 30, 1864; a conoidal musket-ball entered the left temporal region, passed diagonally across the left orbit, and emerged through right nostril, destroying the left eye entirely; transferred from one hospital to another several times. On Feb. 10, 1865, he was discharged from the service. In 1869 he was a pensioner; disability rated total. Mastication was difficult, sense of smell affected, left eye destroyed, and sight of right eye impaired. His mind had become weakened, and he complained of dull pain in head (*loc. cit.*, p. 331).

The history of this case clearly shows that the left glenoid fossa and the ethmoid bone were injured by the missile in its course.

CASE 63. *Gunshot Fracture involving the Anterior Cranial Fossa; Recovery.*—George T. was wounded Jan. 11, 1863; a pistol-ball entered the inner portion of right supra-orbital ridge near base of nose, and, passing outward and slightly downward, fractured the orbital plate and lodged in the frontal sinus. The course of the missile was traced along the fracture as far as the bottom of the orbit;

globe of eye destroyed. Subsequently, the inflammation ran very high, and the pain was great. On April 3 he was discharged from the service. In March, 1869, his disability was reported to be three-fourths and permanent (*loc. cit.*, p. 331).

CASE 64. *Gunshot Wound of Right Eye with Fracture of the Base of Skull; Recovery.*—John W., aged 21; wounded May 11, 1864. Fracture of orbital and temporal bones, with loss of right eye caused by the missile; treated in field, Washington, and Philadelphia hospitals. Discharged from the service May 19, 1865, and pensioned (*loc. cit.*, p. 342).

CASE 65. *Gunshot Wound of Left Eye with Fracture of the Base of Skull; Recovery.*—George F. W., aged 22; wounded May 6, 1864. Fracture of orbital and temporal bones with loss of left eye caused by the missile; treated in Washington, Philadelphia, New York, and Albany hospitals; right eye sympathetically affected. Discharged from the service Dec. 13, and pensioned (*loc. cit.*, p. 342).

CASE 66. *Gunshot Wound of Left Eye with Fracture of the Base of Skull; Recovery.*—Alexander N. W.; wounded at Atlanta. Fracture of temporal bone with loss of left eye caused by the ball; treated in field, Chattanooga, and Nashville hospitals. Transferred to Veteran Reserve Corps Dec. 21, 1864 (*loc. cit.*, p. 342).

CASE 67. *Gunshot Wound of both Eyes with Fracture of the Base of Skull; Recovery.*—Wm. H. D., aged 22; wounded June 20, 1864; a conoidal ball entered the inner canthus of right eye, passed through the base of nose and left eye, and emerged at the left temple, destroying both eyes; transferred from hospital to hospital until October 27, 1864, when he was discharged from the service and pensioned (*loc. cit.*, p. 327).

CASE 68. *Gunshot Wound of Eyes with Fracture of the Base of Skull; Recovery.*—H. C. G., admitted to regimental hospital June 28, 1864, with gunshot fracture of temporal bone. A conoidal ball entered right side of head, one inch and a half from outer angle of right eye, and emerged near outer angle of left eye. On the 29th he was left in the enemy's hands, but was afterwards exchanged, and on Oct. 5 discharged from the service, being entirely blind (*loc. cit.*, p. 327).

CASE 69. *Shell Fracture involving the Anterior Cranial Fossa; Recovery.*—John W. W. was wounded Sept. 20, 1863, by a fragment of shell which caused a scalp-wound, grazed the orbital ridge, and destroyed the right eye. On Dec. 21 he was discharged and pensioned. On Feb. 15, 1864, the Pension Examiner reports that the right eye was collapsed, the left eye torn from its proper connections by the blow, and the man totally blind (*loc. cit.*, p. 327).

Such a blow must inevitably fracture the orbital plates of the os frontis, and probably some other bones in the cranial base.

CASE 70. *Gunshot Fracture of the Base of Skull; Recovery.*—Wm. H. F., aged 25, was wounded March 25, 1865, by a conoidal ball which entered the right temple near the outer angle of eye, passed through the orbital portion of the sphenoid bone on both sides, severed in its course the optic nerves of both eyes, and escaped, the point of exit being directly opposite the point of entrance. He complained much of pain in the head, and could not tolerate opium or morphia. Nervines were administered freely, and good wine in small quantity. On April 26 the wound was nearly healed. On June 13 he was discharged and pensioned, being totally blind (*loc. cit.*, pp. 327, 328).

CASE 71. *Gunshot Wound of the Left Eye with Fracture of the Base of Skull; Recovery.*—Wm. B., wounded June 28, 1862; a conoidal ball destroyed the left eye, and passing backward, outward, and upward, fractured the orbit, and emerged at a point two inches above and behind the same eye; in Baltimore and Pennsylvania hospitals until July, 1864, when he was mustered out. On April 23, 1869, the Pension Examiner reports that the bones of the left orbit are all broken away, leaving great deformity (*loc. cit.*, p. 329).

CASE 72. *Gunshot Wound of Left Eye with Fracture of the Base of Skull; Recovery.*—Col. P. R. G., wounded May 5, 1864; a conoidal musket-ball entered just above the inner angle of left eye, passed backward, downward, and outward across the orbit, behind the malar bone and zygoma, and lodged near the

left ear. The missile fissured the os frontis quite deeply at inner extremity of supra-orbital ridge, and must have penetrated the frontal sinus, as well as broken the orbital plate. The eye was destroyed; and in extracting the ball Steno's duct was severed. On June 21 he was mustered out and pensioned. The injury has affected his brain. He suffers from dizziness and confusion of ideas; the dizziness becoming so great at times as to compel him to grasp objects that are near for support. On Feb. 1, 1870, he was totally disabled by reason of pneumo-hydrothorax (*loc. cit.*, p. 330).

The last thirteen cases are reported in the first surgical volume, under the head of "Gunshot Wounds of the Orbital Region" (*loc. cit.*, pp. 325-345), but in all of them the base of the skull was fractured more or less extensively. The next sixty cases are similarly reported.

CASE 73. *Gunshot Wound of Left Eye with Fracture of Basis Cranii; Recovery.*—John F. L., aged 24, wounded May 6, 1864, by a conoidal musket-ball which entered the left eye and lodged at the left temple. The bullet was extracted and the wound dressed in the usual manner. On Feb. 16 he was discharged and pensioned. On Oct. 22, 1866, the Pension Examiner reports that there is depression of the skull over the left eye, resulting in paralysis of left side [of face?] and of upper and lower extremities [of right side?]. He can but just drag himself about (*loc. cit.*, p. 330).

CASE 74. *Gunshot Wound of Left Eye with Fracture of Anterior Cranial Fossa; Recovery.*—Jack K. (Confederate), aged 35; wounded July 21, 1863; a conoidal ball passed from right to left, carried away the nose from root to end of osseous part, destroyed the left eye, and emerged from the outer angle of left orbit. It barely missed the right eye. Portions of brain-tissue escaped. Cold water dressings were applied; opiates and stimulants were given. Six weeks after the misadventure he was returned to the hands of the Confederates. He had been able to walk about the ward for two weeks; the wound was doing well, giving promise of entire recovery (*loc. cit.*, p. 330).

The escape of cerebral tissue proves that the cranial base and the dura mater were broken through by the missile.

CASE 75. *Gunshot Wound of Left Eye with Fracture of Base of Skull; Recovery.*—Colonel James W. was wounded July 18, 1864; a conoidal ball entered the corner of his left eye, and emerged below his right ear. His right side became paralyzed, and his face grew distorted from contraction of the facial muscles. The left eye was entirely destroyed. He was mustered out on July 5, 1865, and pensioned, his disability being rated total and permanent (*loc. cit.*, p. 331).

The occurrence of hemiplegia on the right side shows that the left cerebral hemisphere was injured, and that the left orbital plate of os frontis was probably broken.

CASE 76. *Gunshot Fracture of both Orbits and Base of Skull; Recovery.*—Peter B., aged 30, was wounded July 2, 1863; a conoidal musket-ball entered at the upper margin of right zygoma, passed through the apex of the right orbit, and emerged about the centre of lower margin of the left orbit; treated in field and Philadelphia hospitals. Ordinary dressings were applied to the wound; cathartics, stimulants, and tonics were administered. On the 30th wound already healed, and stiffness of jaw only complained of. Right eye totally destroyed; vision of left eye good. On Nov. 3, he was transferred to the Veteran Reserve Corps. On Dec. 19, 1866, the Pension Examiner reports that the lens of right eye is opaque, that the lachrymal duct of left eye is obliterated, and that the visual power is much impaired (*loc. cit.*, p. 329).

CASE 77. *Gunshot Wound of Right Eye with Fracture of Base of Skull; Recovery.*—Darius A., wounded March 5, 1863; bridge of nose, right eye, and portion of temporal bone carried away by a conoidal ball; also wound of left thigh. Taken prisoner, exchanged, and treated at Annapolis and Camp Chase. Discharged from the service Oct. 23 (*loc. cit.*, p. 332).

CASE 78. *Gunshot Fracture involving Anterior and Middle Fossa of Cranium; Recovery.*—L. A., aged 21; wounded July 18, 1864; a conoidal ball entered above the left eye, and lodged under the right ear; field, Washington, and Philadelphia hospitals. Left eye destroyed. Discharged June 14, 1865, and pensioned (*loc. cit.*, p. 332).

In this case the missile destroyed the left eye, and passed diagonally backward, downward, and toward the right, fracturing the left frontal and right temporal bones at their bases.

CASE 79. *Gunshot Wound of Left Eye with Fracture of Anterior Cranial Fossa; Recovery.*—Joel A. received a gunshot wound, fracturing orbital plate, and destroying left eye, on May 3, 1863. Sight of right eye sympathetically impaired. Treated in Washington, Delaware, and New Jersey Hospitals. Discharged on Dec. 11, and pensioned (*loc. cit.*, p. 332).

CASE 80. *Gunshot Fracture of Left Orbit and Petrous Bone; Recovery.*—Isaac H. B., aged 21, was wounded May 16, 1863. Missile entered at external canthus of left eye, passed under the brain and emerged through internal ear, fracturing the same and the orbital plate of malar bone, destroying the eye and causing complete deafness of the ear. Treated in Memphis, St. Louis, and Madison hospitals. Discharged July 26, 1864, and pensioned (*loc. cit.*, p. 333).

CASE 81. *Gunshot Fracture of the Base of Cranium with Wound of Right Eye; Recovery.*—John B. was wounded Sept. 17, 1862. A conoidal ball entered the right ear, and emerged from the right eye, completely destroying the globe. Admitted to Satterlee Hospital Oct. 29. The lower eyelid became everted. Discharged Jan. 20, 1863, and pensioned (*loc. cit.*, p. 333).

CASE 82. *Gunshot Wound of Left Eye with Fracture of Anterior Cranial Fossa; Recovery.*—Charles B., aged 31, wounded July 1, 1863. Fracture of frontal bone over left eye by conoidal ball; eye destroyed; also wound of right arm; treated in Pennsylvania and New York hospitals. Discharged Jan. 31, 1865, and pensioned (*loc. cit.*, p. 333).

CASE 83. *Gunshot Wound of Left Eye with Fracture of Anterior Cranial Fossa; Recovery.*—Charles B., wounded Sept. 17, 1862. Fracture of frontal bone by gunshot. Destruction of left eye and partial deafness of left ear. Treated in Corps and Washington hospitals. Discharged from the service November 3, and pensioned (*loc. cit.*, p. 333).

CASE 84. *Gunshot Wound of Left Eye with Fracture of Anterior Cranial Fossa; Recovery.*—Philip B., wounded May 31, 1862, by gunshot. Fracture of frontal bone above left orbit; missile lodged, destroying sight. Treated in field and New York hospitals. Discharged from the service Oct 29 (*loc. cit.*, p. 333).

The last three cases resemble each other very closely. In each of them the left eye was destroyed, and the orbital plate of the os frontis fractured by a gunshot projectile.

CASE 85. *Gunshot Wound of Right Eye and Fracture of Cranial Base; Recovery.*—Charles B., aged 18. Gunshot injury of occipital and frontal bones; with destruction of right eye, received Dec. 18, 1864. Discharged from the service June 26, 1865, and pensioned (*loc. cit.*, p. 333).

CASE 86. *Gunshot Wound of Left Eye and Fracture of Anterior Cranial Fossa; Recovery.*—Thomas G. B., aged 21. A conoidal ball entered the frontal bone to the left of the median line, traversed the frontal sinus, and lodged in the nasal foramen. Left thigh also wounded two inches above knee. Aqueous humour of left eye ran out. Admitted to hospital Dec. 11, 1862. Discharged from the service May 18, 1863. He is not a pensioner, and therefore it is hoped that his recovery is so complete that he does not need assistance (*loc. cit.*, p. 333).

In all probability the left orbital plate of the frontal bone was also broken.

CASE 87. *Gunshot Wound of Left Eye and Fracture of the Base of Skull; Recovery.*—Perry C. C., aged 40, received Aug. 29, 1862, a gunshot wound fracturing the temporal and orbital bones, and destroying the left eye. Treated

in hospital at Alexandria. On Oct. 31, he was discharged from the service and pensioned (*loc. cit.*, p. 333).

CASE 88. *Gunshot Wound of Right Eye and Fracture involving Base of Skull; Recovery.*—James A. C., aged 44, wounded March 29, 1865. Temporal bone and bones of face fractured, and right eye destroyed; treated in field, Washington, and Philadelphia hospitals; vision of left eye impaired. On July 27, 1865, he was discharged from the service and pensioned (*loc. cit.*, p. 333).

CASE 89. *Gunshot Wound of Right Eye and Fracture of the Base of Skull; Recovery.*—Franklin C., aged 31, wounded March 21, 1865. Right temporal bone fractured, and right eye destroyed by a conoidal ball; treated in field, New Berne, New York, and Madison hospitals. Discharged from the service on May 26, 1865, and pensioned (*loc. cit.*, p. 333).

CASE 90. *Gunshot Wound of Left Eye and Fracture involving the Base of Skull; Recovery.*—Charles C., aged 20, wounded Sept. 19, 1864. Left temporal bone and upper jaw fractured; left eye destroyed; treated in field and Philadelphia hospitals; several pieces of upper jaw removed. Discharged from the service, June 2, 1865, and pensioned (*loc. cit.*, p. 333).

CASE 91. *Gunshot Fracture involving the Base of Skull; Recovery.*—James W. D., wounded June 22, 1863. The missile entered the left zygomatic process, passed slightly upward and backward across the base of the cranium, and emerged on the opposite side just above the right zygoma. The optic nerve of the right eye was carried away, and the eye itself forced forward. He lay insensible for three days; fragments of bone were thrown off; gangrene. Mustered out on July 30, 1864, and pensioned (*loc. cit.*, p. 335).

CASE 92. *Gunshot Wound of Right Eye and Fracture of the Base of Skull; Recovery.*—Oliver P. E., wounded Sept. 1, 1864. Frontal bone fractured and right eye destroyed by a conoidal ball. Treated in field, Chattanooga, and Nashville hospitals. Discharged from the service May 30, 1865, and pensioned (*loc. cit.*, p. 335).

CASE 93. *Gunshot Fracture involving the Base of Skull, etc.; Recovery.*—Robert F., aged 22, wounded May 25, 1864. Frontal, temporal, and malar bones of right side fractured by a conoidal ball. Treated in field and Washington hospitals. Vision of right eye destroyed. Discharged Oct. 3, 1864, and pensioned (*loc. cit.*, p. 335).

CASE 94. *Gunshot Fracture involving the Base of Skull, etc.; Recovery.*—W. J. T. H., aged 20, wounded July 9, 1864. Fracture of right temporal bone and loss of right eye caused by a conoidal ball. Treated in Frederick, Baltimore, and Philadelphia hospitals. Discharged April 18, 1865, and pensioned (*loc. cit.*, p. 336).

The orbital plate of the frontal bone was doubtless fractured in this case, as it was in the following strictly analogous example:—

CASE 95. *Gunshot Fracture of the Base of Skull, etc., Recovery.*—Capt. H. V. H. (Confederate). Treated in the military hospitals at Baltimore. Left temporal and orbital bones fractured; sight of left eye destroyed. He recovered, and on June 9, 1865, was sent to the post prison at Fort McHenry (*loc. cit.*, p. 336).

CASE 96. *Gunshot Wound of Right Eye with Fracture of the Anterior Cranial Fossa; Recovery.*—Robert H., aged 22, wounded May 5, 1864. Fracture of the right frontal bone with depression, and destruction of the right eye caused by a conoidal ball. Treated in Washington and Pittsburgh hospitals. Discharged November 14, 1864, and pensioned (*loc. cit.*, p. 336).

CASE 97. *Gunshot Wound of Right Eye with Fracture of the Anterior Cranial Fossa; Recovery.*—Edwin H., aged 32, wounded July 23, 1864. Fracture of frontal bone, and loss of right eye. Treated in field and New York hospitals. Discharged from the service Jan. 12, 1865, and pensioned (*loc. cit.*, p. 336).

CASE 98. *Gunshot Wound of Left Eye with Fracture of the Anterior Cranial Fossa; Recovery.*—Isaac H. (Confederate), wounded and captured July 1, 1863. Frontal bone fractured and left eye destroyed. Treated in Gettysburg and Baltimore hospitals. Paroled Sept. 25, 1863 (*loc. cit.*, p. 336).

CASE 99. *Gunshot Fracture involving the Base of Skull, etc.; Recovery.*—Lieut. George W. H., aged 37, wounded Oct. 6, 1864. Fracture of orbital and temporal bones, and loss of left eye, caused by a conoidal ball. Treated in Jefferson City Hospital. Returned to duty Nov. 3, 1864; discharged from the service April 20, 1865, and pensioned (*loc. cit.*, p. 336).

CASE 100. *Gunshot Wound of Right Eye with extensive Fracture of the Base of Skull; Recovery.*—Thomas A. H., aged 16, wounded July 1, 1863. The missile entered just below the inner angle of *left* eye, passed transversely backward and somewhat upward through the *right* eye, destroying it, and emerged three-fourths of an inch in front of upper lobe of *right* ear. Intense tumefaction of right side of face followed. Lower eyelid everted. On August 7 the wounds had healed. On December 31, 1863, he was transferred to the Invalid Corps; he is not a pensioner (*loc. cit.*, p. 336).

In this case it is probable that the orbital plate of the frontal, the sphenoid, and the ethmoid bones were broken, as well as the temporal in front of right ear.

CASE 101. *Gunshot Wound of Right Eye and Fracture of Anterior Cranial Fossa; Recovery?*—T. S. J. (Confederate). Fracture of orbital process of frontal bone on right side, and spine of scapula; right eye involved. Treated in hospital at Richmond; no result recorded. It is, however, believed that he recovered (*loc. cit.*, p. 337).

CASE 102. *Gunshot Wound of Left Eye and Fracture of the Base of Skull; Recovery.*—John J., aged 19, wounded May '9, 1864. Left temporal bone fractured, and left eye destroyed. Treated in field, Louisville, Camp Dennison, and Columbus hospitals. Right eye impaired; vertigo. Discharged, June 2, 1865, and pensioned (*loc. cit.*, p. 337).

Whenever a gunshot projectile fractures one of the temporal bones and destroys one of the eyes in its course, it of necessity passes through the base of the cranium at some point or other, fracturing the same more or less extensively according to the special circumstances of the case.

CASE 103. *Gunshot Wound of Right Eye with Fracture of the Anterior Cranial Fossa; Recovery.*—Edwin R. J., aged 23, wounded Oct. 5, 1864. Fracture of outer edge of right supra-orbital ridge, with loss of eye, caused by a conoidal ball. Treated in field, Nashville, Jeffersonville, and Springfield hospitals. Fragments removed. Returned to duty, Feb. 28, 1865. Discharged May 13, 1865, and pensioned (*loc. cit.*, p. 337).

CASE 104. *Gunshot Wound of Left Eye with Fracture of the Anterior Cranial Fossa; Recovery.*—Patrick J., aged 25, wounded June 29, 1864. Fracture of frontal bone at left orbital ridge, with loss of left eye. Treated in field, Point Lookout, and Washington hospitals. Transferred to Veteran Reserve Corps, Feb. 25, 1865. Discharged from the service, June 28, 1865, and pensioned (*loc. cit.*, p. 337).

CASE 105. *Gunshot Wound of Right Eye with Fracture of the Anterior Cranial Fossa; Recovery.*—Elias W. K., aged 34, wounded June 15, 1864. Fracture of frontal bone and destruction of right eye. Treated in field, Nashville, and Louisville hospitals. Vision of left eye also impaired. Discharged from the service, December 28, 1864, and pensioned (*loc. cit.*, p. 337).

CASE 106. *Gunshot Wound of Left Eye with Fracture of the Anterior Cranial Fossa; Recovery.*—Michael K., wounded Dec. 13, 1862. Frontal bone fractured and left eye destroyed. Treated in field and Washington hospitals. Vision of right also very imperfect. Discharged from the service Feb. 5, 1863, and pensioned (*loc. cit.*, p. 337).

CASE 107. *Gunshot Wound of Right Eye and Fracture of the Base of Skull; Recovery.*—Oliver K., aged 19, wounded March 29, 1865. Malar and sphenoid bones fractured, and right eye destroyed. Treated in field, Washington, and Philadelphia hospitals. Discharged from the service, June 28, 1865, and pensioned (*loc. cit.*, p. 337).

CASE 108. *Gunshot Wound of Left Eye and Fracture of the Base of Skull; Recovery.*—Lieut. Moses W. L., aged 34, wounded March 1, 1865. Fracture of temporal bone, with loss of left eye. Treated in hospital at Washington. Discharged from the service, May 6, 1865, and pensioned (*loc. cit.*, p. 337).

CASE 109. *Gunshot Wound of Right Eye and Fracture of the Base of Skull; Recovery.*—Joseph L., aged 27, wounded July 1, 1862. Fracture of temporal bone with loss of right eye. Treated in hospital at Baltimore. Discharged from the service November 16, 1862, and pensioned (*loc. cit.*, p. 337).

CASE 110. *Gunshot Wound of Right Eye with Fracture of the Anterior Cranial Fossa; Recovery.*—Lieut. James H. L., wounded Feb. 25, 1865. Fracture of frontal bone with loss of right eye. Treated in field and City Point hospitals. Discharged from the service August 26, 1865, and pensioned (*loc. cit.*, p. 337).

CASE 111. *Gunshot Wound of Left Eye, with Fracture of Anterior Cranial Fossa; Recovery.*—Thomas M., aged 25, wounded June 20, 1864. Fracture of frontal bone and loss of left eye. Treated in field, Nashville, Louisville, and Camp Dennison hospitals. Discharged from the service May 31, 1865, and pensioned (*loc. cit.*, p. 338).

CASE 112. *Gunshot Wound of Left Eye, with Fracture of Anterior Cranial Fossa; Recovery.*—George G. P., aged 32, wounded May 3, 1863. Fracture of frontal bone and loss of sight of left eye. Treated in field and Washington hospitals. Discharged Dec. 19, 1863, and pensioned (*loc. cit.*, p. 339).

CASE 113. *Gunshot Wound of Right Eye with Fracture of Anterior Cranial Fossa; Recovery.*—George R., wounded Sept. 17, 1862. Frontal bone fractured and right eye destroyed. Discharged from the service Nov. 15, 1862, and pensioned (*loc. cit.*, p. 339).

Whenever a cylindro-conoidal musket-ball penetrates or destroys the eyeball, and at the same time fractures the frontal bone, the anterior fossa of the basis cranii is, too, almost always involved in the breach, as happened in the last case and in several others which precede it.

CASE 114. *Gunshot Wound involving Right Eye and Base of Skull; Recovery.*—Sergt. Aquilla M., aged 23, wounded Sept. 20, 1863. Right temporal bone fractured, and sight of right eye destroyed. Treated in field, Chattanooga, Nashville, and Columbus hospitals. Discharged from the service July 11, 1864, and pensioned (*loc. cit.*, p. 338).

CASE 115. *Gunshot Wound involving Right Eye and Base of Skull; Recovery.*—John W. M., wounded Oct. 22, 1862. Fracture of frontal and temporal bones, with loss of right eye. Treated in hospital at Hilton Head. Hearing of right ear also impaired. Discharged from the service Dec. 14, 1862, and pensioned (*loc. cit.*, p. 338).

CASE 116. *Gunshot Wound involving Right Eye and Base of Skull; Recovery.*—Wm. H. M., aged 23, wounded Nov. 30, 1864. Frontal and temporal bones injured, and right eye destroyed. Treated in hospital at Hilton Head. Discharged May 9, 1865, and pensioned (*loc. cit.*, p. 338).

CASE 117. *Gunshot Wound of Left Eye, with Fracture of Base of Skull; Recovery.*—Sergt. Hugo M., wounded Sept. 14, 1862. The missile entered behind the left mastoid process of the temporal, and passing forward, emerged through the left orbit, carrying the left eye away. Discharged Nov. 27, 1862, and pensioned. Left side of face paralyzed. Great deformity. Cannot shut the right eye (*loc. cit.*, p. 339).

CASE 118. *Gunshot Wound of Right Eye and Fracture of Base of Skull; Recovery.*—Capt. David R., wounded Sept. 29, 1863. Right temporal bone fractured, and right eye destroyed. Treated in hospital at New Orleans. Returned to duty Nov. 6, 1863. Discharged from the service March 11, 1864, and pensioned (*loc. cit.*, p. 339).

CASE 119. *Gunshot Wound of Left Eye and Fracture of Base of Skull; Recovery.*—Sutton R. (coloured), aged 20, wounded June 17, 1864. Fracture of temporal bone, and destruction of left eye. Treated at Point Lookout. Returned to duty Nov. 14, 1864 (*loc. cit.*, p. 339).

CASE 120. *Gunshot Wound of Right Eye and Fracture of Base of Skull; Recovery.*—Christopher R., aged 35, wounded May 6, 1864. Fracture of temporal bone, with loss of right eye. Treated in field, Washington, and Detroit hospitals; headache, vertigo, and mental aberration. Discharged from the service Aug. 29, 1864, and pensioned (*loc. cit.*, p. 340).

CASE 121. *Gunshot Wound of Right Eye and Fracture of Base of Skull; Recovery.*—Lieut. Andrew B. R., aged 27, wounded July 16, 1864. Temporal and nasal bones fractured, and right eye destroyed. Treated in Chattanooga and Nashville hospitals. Senses of taste and smell nearly destroyed. Discharged May 15, 1865, and pensioned (*loc. cit.*, p. 340).

In this case the ethmoid bone was also broken, and this lesion was attended with almost complete obliteration of the olfactory sense.

CASE 122. *Gunshot Wound of Right Eye and Fracture of Base of Skull; Recovery.*—Daniel M. R., aged 21, wounded May 10, 1864. Frontal and nasal bones fractured, and right eye destroyed. Treated in field, Washington, and New York hospitals. Vision of left also imperfect. Returned to duty July 28, 1864. Discharged Dec. 22, 1864, and pensioned (*loc. cit.*, p. 340).

CASE 123. *Gunshot Wound of Left Eye, and Fracture involving Anterior Cranial Fossa; Recovery.*—Matthew S., aged 36, wounded April 6, 1865. Frontal bone fractured and left eye destroyed. Treated in field, City Point, and Washington hospitals. Discharged June 14, 1865, and pensioned (*loc. cit.*, p. 340).

CASE 124. *Gunshot Wound of Right Eye and Fracture involving Anterior Cranial Fossa; Recovery.*—Wm. H. S., wounded Sept. 13, 1864. Frontal bone fractured and right eye destroyed. Treated in Fort Monroe and New York hospitals. Discharged June 27, 1865 (*loc. cit.*, p. 340).

CASE 125. *Gunshot Wound of Right Eye and Fracture involving Anterior Cranial Fossa; Recovery.*—Lieut. George A. S., wounded June 18, 1864. Fracture of os frontalis, with loss of right eye; also fracture of right scapula, and flesh wounds of right arm and right hip. In hospital at Detroit. Discharged from the service Oct. 15, 1864 (*loc. cit.*, p. 340).

CASE 126. *Gunshot Wound of Right Eye, and Fracture involving Anterior Cranial Fossa; Recovery.*—Alden S. S., aged 26, wounded Sept. 19, 1864. Frontal bone fractured, and right eye destroyed; right leg also fractured. Field, Baltimore, Brattleboro, and Montpelier hospitals. Discharged June 12, 1865, and pensioned (*loc. cit.*, p. 341).

CASE 127. *Gunshot Fracture involving Orbit and Anterior Cranial Fossa; Recovery.*—John S., wounded Sept. 17, 1862. Gunshot fracture of superciliary ridge and frontal bone. Baltimore hospital. Vision of the right eye impaired, and vertigo. Discharged Nov. 26, 1862, and pensioned (*loc. cit.*, p. 341).

CASE 128. *Gunshot Wound of Right Eye; Anterior Cranial Fossa extensively Fractured; Recovery.*—Warren S., aged 21, wounded May 5, 1864. Frontal, orbital, and maxillary bones fractured, and right eye destroyed. Field, Washington, Chester, and New York hospitals. Discharged Sept. 5, 1864, and pensioned. Has constant pain in head, with frequent attacks of vertigo (*loc. cit.*, p. 341).

CASE 129. *Gunshot Wound of Left Eye, and Fracture involving Anterior Cranial Fossa; Recovery.*—Patrick S., aged 28, wounded May 12, 1864. Frontal bone fractured, and left eye destroyed. Had previously received wounds of abdomen and foot. Field, Washington, Readville, and Worcester hospitals. Discharged July 21, 1865, and pensioned (*loc. cit.*, p. 341).

CASE 130. *Gunshot Wound of Left Eye; Anterior Cranial Fossa Fractured; Recovery.*—Sergt. Isaac S., wounded July 3, 1863. Fracture of left supra-orbital arch, with loss of left eye. Seminary and York hospitals. Oct. 1, fragments of ball removed; Oct. 21, returned to duty. May 25, 1864, killed in battle near Dallas, Ga. (*loc. cit.*, p. 341).

CASE 131. *Gunshot Wound of Right Eye; Anterior Cranial Fossa Fractured; Recovery.*—Samuel G. T., frontal bone fractured and right eye destroyed. Louisville hospital. Returned to duty March 11, 1863. Discharged April 22, 1863, and pensioned (*loc. cit.*, p. 342).

CASE 132. *Gunshot Wound destroying both Eyes and fracturing the Base of the Skull; Recovery.*—John M., aged 42, wounded April 2, 1865, by a conoidal ball, which entered the anterior part of right temporal region, passed transversely across both orbits, and emerged at a corresponding point on the opposite side of head. Treated in hospital at Fort Monroe and Albany. Discharged from the service Nov. 30, 1865, and pensioned. He was totally blind, and the orbits were filled with profuse granulations of a flabby, spongy character. There was slight ectropion of both eyelids, the lashes resting against the contents of the sockets, giving rise to considerable irritation (*loc. cit.*, p. 327).

In this case the missile necessarily broke the orbital roofs which to a considerable extent form the flooring of the anterior cranial fossa.

CASE 133. *Gunshot Wound of Left Orbit and Anterior Cranial Fossa; Recovery.*—Jacob M., aged 25, was wounded Sept. 19, 1863, by a buckshot, which fractured and lodged in the frontal bone near the nasal eminence, causing fracture of left orbit and exophthalmos of left eye. Treated in Nashville, Louisville, and Indiana hospitals. On June 15, 1864, the missile was extracted. Expectant treatment only was used. The patient, recovering, was mustered out Sept. 17, 1864, and pensioned. On Aug. 17, 1868, the Pension Examiner reports the patient suffering from caries of the frontal bone, attended with purulent discharge, loss of power in left eye, general disturbance of the mental faculties, which are aggravated when the wound discharges much, and at times complete prostration. A subsequent report, dated Jan. 7, 1870, confirms previous statement of his condition, and states his disability as total and permanent (*loc. cit.*, p. 164).

In the above case the missile fractured the orbital plate of the os frontis, and probably some other parts of the anterior cranial fossa.

CASE 134. *Gunshot Wound involving the Base of Skull; Recovery.*—Henry A. B., wounded June 1, 1864, by a conoidal musket-ball, which fractured the temporal, malar, superior and inferior maxillary bones of right side. Treated in field, Alexandria, De Camp, and Dale hospitals. Discharged, May 9th, 1865. He is not a pensioner (*loc. cit.*, p. 166).

In this case the missile necessarily involved the basis of the cranium in its course.

CASE 135. *Gunshot Wound involving the Anterior Cranial Fossa; Recovery.*—Samuel P. I. was wounded August 14, 1864, by a conoidal ball, which entered at the outer edge of the left superciliary ridge of the frontal bone, passed backward and downward, involving in its course the lower surface of the left anterior lobe of the cerebrum and the left orbital plate. Treated in field hospital, and furloughed. On January 27, 1865, he was discharged from the service and pensioned. On June 21, 1866, the Pension Examiner reports a small depression at wound of entrance from loss of bone; patient slightly affected in mind, and guilty of irregularities both mental and moral; disability rated at one-fourth and permanent (*loc. cit.*, p. 191).

It is probable that some additional cases belonging to the same category as the foregoing might be gleaned by making a more vigorous search of the remarkable collection of cases wherein they were found: but enough have been presented to show abundantly (1) that recovery took place in a very large proportion of all the cases of gunshot fracture involving the base of the skull whereof abstracts are published in the *Medical and Surgical History of the War of the Rebellion*; and (2) that fractures in general which involve the base of the skull prove mortal much less frequently than heretofore has generally been supposed.

Of the one hundred and thirty-seven cases related or referred to in the foregoing pages of this article, thirty-five appear to have recovered so fully as to go back to duty permanently or to enter the Veteran Reserve Corps on the one hand, or to be mustered out of, or discharged from, the service without pension on the other. At least one of those returned to duty was afterwards killed in battle. Two or three recovered so completely as to re-enlist. Most of them, however, were discharged from the service and pensioned, their disabilities ranging from one-fourth all the way up to total. Some of these died a long time afterward of diseases having no connection with the cranial lesion. But, many of these cases show that disability resulting from cerebral lesions may increase with the lapse of time. This circumstance is of practical importance to Pension Examiners, and to all surgeons who have to deal with this class of injuries.

In about one-half of the cases related above, the breach occurred in bones which lie beneath the anterior cerebral lobes, *i. e.* in the anterior cranial fossa, and hence it is inferred that fractures involving the anterior cranial fossa are much less fatal than fractures involving the other parts of the cranial base.

Among the practical lessons to be drawn from the foregoing cases are the following: 1. Fractures involving the base of the skull are not of necessity mortal; on the contrary, a considerable proportion of them recover. 2. Those patients will do best who are kept at *rest* and treated *antiphlogistically*, *i. e.* with meagre diet, cold to head, purgatives, mercurials, blisters, etc., *pro re nata*, during the inflammatory and suppurative period after the mishap. Several apparently desperate cases were saved in this way; and for want of such treatment many recovered but imperfectly, or did even worse than that. 3. Ligation of the common carotid artery may be successfully employed for the arrest of hemorrhage from the middle meningeal artery. Two cases were successfully treated on this plan. 4. A considerable number of patients suffering from gunshot fracture of the cranial base, especially such as have been imperfectly, inadequately, or neglectfully treated, will, after appearing to improve for some considerable time, begin to deteriorate, and acquire atrophy and contraction of tendons in paralyzed limbs, more headache and vertigo, increased blindness and deafness, traumatic epilepsy, impairment of the mental faculties, etc. Many cases related above illustrate the truth of this sad statement. The great practical lesson to be drawn therefrom is that in all cases where this lesion is present, the possibility of so unfortunate a result should steadily be kept in view, and the treatment should be carried out with corresponding thoroughness as long as needed. Above all, quiet surroundings with *rest* of body and mind, and enforcement of the antiphlogistic regimen should be secured for the patient throughout the inflammatory period.

Thus, it is shown that the experience garnered by the industry of our military and pension surgeons during and since the late civil war has added much information of a practical character to our knowledge of this important subject; and the writer feels that he has done a meritorious work in collecting and presenting it to the readers of this Journal.

ARTICLE IV.

NATURE OF THE ACTION OF BELLADONNA ON THE SYSTEM. By THOMAS WHARTON JONES, F.R.C.S., Professor of Ophthalmic Medicine and Surgery in University College, London.

THE remarkable character of the action of belladonna on the system and its poisonous quality when taken in an overdose are claims for the attentive study of its *modus operandi* which therapeutists, pathologists, and medical jurists alike recognize. And yet, if the facts stated and the explanations of them propounded in this article be correct, it will appear that the hitherto received doctrine on the subject is, for the most part, fundamentally erroneous.

In cases of belladonna poisoning which have terminated fatally, venous congestion of the brain and spinal cord with serous effusion has been found on *post-mortem* examination. To this state the derangement of the cerebral and muscular functions which forms so prominent a symptom of the poisoning during life is, no doubt, owing. The flushing of the skin and blood-shot state of the conjunctiva in simple atropism are external manifestations of venous congestion likewise.

Now the question arises, What is the nature of the action whereby belladonna causes this disturbance of the circulation in the extreme vessels?

Preliminary to attempting an answer to this, however, we have to inquire into the more general question respecting the nature of the conditions on which venous congestion otherwise fundamentally depends.

It is a matter of common remark, I believe, that in a part where venous radicles are found congested with blood, there a constricted state of the small arteries leading to them is to be observed. In respect to this, let it be particularly noted that the blood with which the venous radicles are, in such cases, gorged, has not been driven into them by the contraction of the arteries nor by any increased exertion of the heart's force. The distension of the veins is owing to accumulation of blood, permitted by the retardation of its flow in those vessels occasioned by the resistance offered to the free circulation through the constricted arteries of the part.

The spasmodic constriction of the small arteries which takes place at

the moment of death, it is to be further noted, does not drive the blood onwards through the capillaries into the veins, but, there being no longer any *vis a tergo* from the now pulseless heart, the constriction of the small arteries causes regurgitation of the blood contained in them towards their trunks.

The fact, which I have elsewhere so often insisted on, that dissipation of a state of congestion in the frog's web follows the relaxation of the walls with dilatation of the calibre of the small arteries which is induced as a secondary effect of the application of a drop of some irritating liquid to the part may be taken, conversely, as a proof that constriction of the small arteries is the condition on which the congestion depended.

To recur now to the *modus operandi* of belladonna in causing venous congestion: In the web of a frog under the microscope we observe that, after the application of a drop of a strong solution of the sulphate of atropia, constriction of the small arteries takes place owing to contraction of their muscular coat, as is evidenced by the increase in thickness of their walls. The effect of this constriction of the calibre of the small arteries on the flow of blood in the part, we see, is to retard it so that venous congestion results.

We sometimes also find that atropia dropped into the eye excites great vascular congestion of the conjunctiva.

From this we may fairly conclude that the concatenation of the phenomena in belladonna poisoning stands thus: 1st. Constriction of the small arteries induced by the special action which belladonna exerts on the muscular coat of those vessels stimulating it to contract. 2d. The establishment of venous congestion in the brain and spinal cord, for example as the effect of the obstruction of the flow of blood in the constricted arteries. 3d. The cerebral and muscular disturbance arising from the venous congestion in the brain and spinal cord.

Constriction of the calibre of an artery caused by contraction of the muscular coat, excited by atropia, corresponds fundamentally with the dilatation of the pupil caused by contraction of the radiating muscular fibres of the iris, which the atropia solution dropped into the eye excites. This brings me to inquire into the particular mechanism of the action of atropia on the pupil: And first it is to be noted that in addition to the muscular contractility of the circular fibres composing the sphincter pupillæ and of its radiating fibres composing the dilator pupillæ, the iris possesses the property of elasticity. Now unless this double endowment of the iris—*vital contractility* and *physical elasticity*—be taken into due consideration, no correct analysis of the phenomena of the motions of the pupil can be made.

In birds, in which the sphincter pupillæ muscle is very much developed (its fibres, it may be observed, are of the transversely striped variety) and in which there is no true dilator pupillæ muscle, the elasticity of the iris

causes the pupil to become widely dilated on the cessation of the action of the circular muscular fibres forming the sphincter, as may be seen in a dead bird's eye; but *such is not the case in the human eye*. Here the pupil is always found, when examined *some time after death*, of medium width—neither much contracted nor much dilated. The operation of the elasticity of the iris is such that it brings the pupil back to this medium width, whatever the state of that aperture may have been at the moment of death. We can demonstrate the operation of the elasticity of the iris by the following experiment.¹ In a *post-mortem* examination, detach the anterior segment of the eyeball by abscission, place it in a saucerful of water and remove the lens. If now we introduce a closed forceps into the pupil and allow the blades to separate so as to stretch wide the aperture, we find on withdrawing the instrument that the pupil comes back to its previous width by means of the elastic reaction. If, on the other hand, we stretch the iris towards the centre of the pupil, as it were to contract the aperture, the elasticity of the iris again will bring back the pupil to its previous width on the remission of the stretching force.

The physical elasticity of the iris thus operates as an intervening power between the vital contractions of the sphincter and dilator muscles of the pupil, so that they are not in a constant struggle with each other, like two wrestlers, as is commonly supposed. In proof of this, may be adduced, the fact that where the sphincter pupillæ is paralyzed, as it is, in common with the levator palpebræ superioris, rectus internus, rectus superior, rectus inferior, and obliquus inferior muscles, in cases of paralysis of the third nerve, the pupil is not dragged into a state of full dilatation by unrestrained action of the dilator pupillæ. This muscle is itself restrained by the elasticity of the iris, and in order that the pupil may, in such a case, be brought to a state of full dilatation it is necessary to drop the solution of atropia into the eye, in order to excite to contraction the dilator pupillæ.

This fact shows how erroneous the common opinion is that atropia causes dilatation of the pupil by paralyzing the sphincter muscle and giving scope to unrestrained action of the dilator; while it incontrovertibly proves that atropia operates, as I have long maintained, by directly exciting to contraction the radiating muscular fibres composing the dilator pupillæ. This is, indeed, so self-evident that it is amazing to me to find physiologists and therapeutists to have gone on so long repeating the old story as to the paralyzing action of belladonna.

Atropia applied to the web of a frog causes constriction of the small arteries by exciting to contraction their muscular coat in about the same time that it takes to produce dilatation of the pupil, when dropped into the eye, by exciting to contraction the radiating muscular fibres of the iris—say from ten to twenty minutes.

¹ See a paper of mine "On the Motions of the Pupil," Edinburgh Medical and Surgical Journal, 1833.

It is a phenomenon of ready observation that when the atropia has as yet acted only incompletely, the pupil will rapidly become more dilated if we cover the eye, but will contract again on exposure to the light. This contraction, however, is only to the degree of width in which the pupil was when the atropia had as yet acted partially. In a short time longer—say ten to twenty minutes in all, after the atropia was first dropped into the eye, the pupil is found fully dilated and cannot now be excited to contraction by exposure to the light.

In like manner, I have seen an artery of the frog's web, when as yet only partially constricted by the action of atropia on its muscular coat, become rapidly more constricted in consequence of the further contraction of its muscular coat, excited by some ordinary stimulus, such as mechanical irritation of the web; but this further contraction I have found quickly to subside, and the calibre of the artery return to the smaller degree of constriction to which it had been brought by the incomplete action of the atropia on its muscular coat. By and by, however, after the time required for the complete action of the atropia on the artery, I have found the calibre of the vessel to have become constricted more fully and persistently.

Besides the well-known dryness of the throat, pallor of the skin preceding the flushing has been found to occur as an early symptom of atropism. This, no doubt, is an effect of the constriction of the small arteries before there has been time for the accumulation of blood in the venous radicles, which supervenes as a consequence of the arterial constriction, and which causes the flushing.

Though belladonna is thus not a paralyzing agent fundamentally, but is, in fact, a stimulant of organic muscular action, the congestion of the brain and spinal cord induced by it, operates secondarily, with a general kind of paralyzing effect.

Whilst atropia causes dilatation of the pupil, by exciting to contraction the dilator pupillæ muscle, Calabar bean, or its principle esserine, causes contraction of the pupil, by exciting to action the sphincter pupillæ muscle. To this I may add, that I have found Calabar bean to exert a constricting action on venous radicles, by exciting contraction of their muscular coat.¹

Atropia and Calabar bean, though thus so far antagonistic to each other, cannot be viewed as exactly antidotal. A real antidote to belladonna should be, for example, an agent causing relaxation of the walls of the small arteries, whereby their calibre is permitted to yield to dilatation by the stream of blood, so that the free circulation is re-established. It is in some such manner that diffusible stimulants hitherto employed in belladonna poisoning seem to act.

¹ Calabar bean exerts no special action on the muscular coat of the arteries. Like any ordinary irritant of the web of a frog, I have seen it excite, on the first application, a slight constriction of their calibre which, however, quickly subsided.

In conclusion, it may be interesting to remark on the consentaneousness of the contraction of the muscular coat of the arteries, and of the radiating muscular fibres of the iris. Both are under the control of the sympathetic nerve,—both are stimulated to action by belladonna, and both become spasmodically contracted at the moment of death. The pallor of death, as before said, is owing to constriction of the small arteries (occasioned by contraction of their muscular coat) by which the blood is regurgitated into the arterial trunks—not driven onward into the veins. As to the pupil at the moment of death: A patient suddenly fell back dead, while Sir William Jenner was looking him in the face. At this very moment, Sir William told me that he observed the pupil to become widely dilated. This dilatation, as before said, was owing to the spasmodic contraction of the radiating muscular fibres of the iris. On the subsidence of the rigor mortis of these fibres, however, the physical elasticity of the iris brings the pupil into the middle degree of width—this being the state, as before observed, in which the dilator muscle and sphincter muscle are both relaxed.

After the subsidence of *rigor mortis*, in the case of the small arteries, a part admits of being more finely injected. Though relaxed, the arteries may not dilate of themselves without distension with an injected fluid, there being no marked elastic dilating agent in their structure, such as we find in the walls of the larger arteries.

ARTICLE V.

AN ACCOUNT OF TWO CASES OF PELVIC ANEURISM.¹ By HENRY B. SANDS, M.D., Professor of the Practice of Surgery in the College of Physicians and Surgeons, New York.

CASE I. *Gluteal Aneurism, treated by Digital Compression, with the hand in the rectum, and by Compression of the Aorta with Lister's Tour-niquet; no Result.*—Edwin C., a spare but healthy looking man, twenty-eight years old, entered the Roosevelt Hospital, under my care, on Dec. 6, 1879, and gave the following history: He had been a clerk by occupation; had always been temperate, and had never contracted syphilis. Twelve years before admission he fell from a wagon, striking on the buttock. He could not remember which side was injured, but thought that the injury must have been slight, as it did not cause lameness or pain after the lapse of the first few days. Six years ago he had an attack of "sciatica" in the right thigh and leg, and ever since that time he had been subject to occasional pain in the same limb, the pain being, perhaps, most marked in the situation now occupied by the tumour. Fifteen months ago a small, prominent swelling was discovered in the right gluteal region; and, three months ago, the disease being recognized as aneurismal, the patient

¹ Read before the New York Surgical Society, Feb. 22, 1881.

was kept in bed, and treated by moderate digital compression of the abdominal aorta, and by the internal administration of the iodide of potassium, in doses of fifteen grains, three times a day, combined with infusion of digitalis. No benefit resulting, he was recommended by his attending physician, Dr. N. W. Leighton, of Brooklyn, to apply to me for hospital treatment. On examination, I found a deep-seated, extensive, and moderately prominent swelling, situated on the right side of the buttock, and presenting all the features of an aneurism. It was ovoid in shape, its lower margin corresponding with "Nélaton's line," while its upper limit reached a point one inch above the highest part of the iliac crest. The long axis of the tumour was directed obliquely downward and inward. A line drawn from the anterior superior spinous process of the ilium to the posterior median line of the sacrum, $8\frac{1}{4}$ inches above the anus, measured $13\frac{3}{4}$ inches; a line extended between the corresponding points on the left side measured $11\frac{1}{4}$ inches. The tumour was moderately firm, apparently because the gluteal muscles were in a state of tension; compression, however, greatly reduced its size, which was regained quite rapidly when the pressure was removed. Expansile pulsation, and a well-marked systolic murmur, were detected over the entire surface of the swelling, the murmur being most intense near its upper and its lower part. Both pulsation and murmur ceased when firm pressure was made on the abdominal aorta, or on the right common iliac artery through the abdominal wall. Pulsation in the femoral and tibial arteries was alike on both sides. No disease could be discovered affecting the heart or kidneys.

A careful consideration of the facts above stated led me to regard the case as one of gluteal aneurism. No other disease would account for the symptoms present, except a malignant, pulsating tumour of the pelvis; and this seemed to be excluded by the slow growth of the tumour, the absence of cachexia, enlarged glands, secondary tumours, or of bony tissue at the margin of the swelling. Aware, however, of the difficulty often encountered in distinguishing between these two diseases, and of the unavoidable mistakes in practice which had been made by experienced surgeons, I determined to resort to manual exploration of the rectum, with the object of throwing light upon the nature of the disease, and of attempting to cure it in the event of its proving to be aneurismal.

Accordingly, on Dec. 13th, the patient having been etherized, and an elastic bandage applied so as to compress the femoral artery in Scarpa's space, I introduced my right hand into the rectum, and noted the following facts: The lower part of the abdominal aorta, the right common and external iliac arteries, seemed normal. The right internal iliac artery, on the contrary, was found to be tortuous, and dilated to nearly twice its natural size, from its origin to a point about an inch internal to the sciatic notch, where it merged into a compressible, pulsating swelling, nearly an inch in diameter, which appeared to be an internal prolongation of the gluteal tumour.

The examination thus confirmed the diagnosis of aneurism, and at the same time demonstrated that, in this particular case, either of the two operations usually recommended for the cure of gluteal aneurism would be dangerous and ineffectual. The question had been raised, whether the

disease was of traumatic origin; and if, acting upon this supposition, the operator were to lay open the sac, he would find the afferent artery beyond his reach, and encounter uncontrollable hemorrhage. Likewise, if the alternative of tying the internal iliac were adopted, the diseased condition of the artery would doubtless prevent success. Manual exploration of the rectum is therefore shown to be a most valuable resource in cases of gluteal aneurism, and should always be practised before resorting to the use of the knife.

Apart from these considerations, however, I had already decided to try another expedient, the idea having suggested itself to me, that cases of pelvic aneurism might properly be treated by digital pressure, exerted through the wall of the rectum. By this means I thought that the artery could be readily controlled without interfering with the accompanying vein, and without the risk which is incurred, when a tourniquet is applied, of damaging the small intestine or the peritoneum.

Accordingly, after completing the examination, I immediately reintroduced the hand, and compressed the upper part of the common iliac artery against the spinal column, placing the middle finger directly over the artery, and the index and ring fingers on either side of the vessel, to prevent it from slipping. Very moderate pressure sufficed to stop the flow of blood through the artery, and only occasionally was it found necessary to reinforce the pressure made by the hand in the rectum by that of an assistant, placed upon the anterior abdominal wall. The hand was removed from the rectum at the end of an hour and a half, when the tumour, which, during this period, ceased to pulsate, was observed to be tolerably firm, and to yield only a feeble pulsation and murmur. Unfortunately, the hopes which were excited by the immediate result of the procedure were not fulfilled, and a few days afterward the aneurism regained its former state. No unpleasant symptoms having followed the operation, I repeated it for the same length of time eight days later, on Dec. 21. On this occasion the fingers were several times shifted to different parts of the artery with the view of diminishing the risk of injuring the coats of the rectum. During these changes of position the circulation was commanded by an assistant, who compressed the aorta against the spine. Partial and temporary consolidation again followed this second attempt, and after an unsatisfactory trial of a horseshoe tourniquet applied over the common iliac artery, I subjected it for a third time, on Jan. 4, to digital pressure made by the hand in the rectum. Pressure was maintained for a period of three hours and fifteen minutes, when the hand became numb and weak, and had to be removed. The result was the same as in the former attempts.

On Jan. 10, instrumental pressure was begun, and during the following three months it was applied about twenty-five times, being made during the first month by a horseshoe tourniquet placed over the common iliac artery, and subsequently by a Lister's tourniquet over the aorta. Usually the instrument was kept on for about three hours, and did not entirely control the circulation. Once, ether was administered, and the aorta was thoroughly compressed for six hours; this caused great weakness of the pulse, and was followed by slight peritonitis. All treatment having proved ineffectual, the patient, who declined to incur the risk of having a

ligature applied to the common iliac, left the hospital on April 14, in the same condition as when he entered it.

The case is instructive, notwithstanding the negative result of treatment. It illustrates, in a striking manner, the value of manual exploration of the rectum in cases of suspected aneurism in the region of the pelvis, and demonstrates the practicability and safety of maintaining, for several consecutive hours, pressure on the great arteries by the fingers placed against the rectal wall. No inconvenience resulted from the procedure, except slight soreness of the rectum, and incontinence of flatus, both lasting only a few days; while the ease and certainty with which the object was accomplished, contrasted remarkably with the difficulty experienced in adjusting the pad of the tourniquet, and in shutting off the flow of blood by this instrument without a dangerous amount of pressure. I anticipate, therefore, success in the employment of this method, notwithstanding its failure in this particular case.

CASE II. *Aneurism of the External Iliac Artery; Ligation of the Common Iliac Artery, with subsequent Amputation of the Thigh; Recovery.*—John G. C., a clerk, 33 years old, came under my care in the New York Hospital on Oct. 9th, 1880, on account of a large pulsating tumour situated in the left iliac fossa. It was ascertained that his grandfather had died of "cancer," seated upon the thigh, and that his aunt had been treated for what was said to be a malignant growth, occupying the left eyelid. The patient was a spare, anæmic, feeble-looking man, who confessed to having led an intemperate life during the past twelve years, and to having had, nine years ago, an attack of syphilis, followed by sore throat, alopecia, and iritis. He stated that three months before admission he was attacked with a severe pain, confined at first to the left knee, but soon extending upward to the groin; and that, at the same time, a swelling, occupying the site of the present tumour, was discovered by his attending physician. Six weeks later, pulsation was detected; and subsequently, the swelling gradually increased, and became more painful up to the time when he entered the hospital. On examining the tumour referred to, I found it to be oblong, its long axis being parallel with Poupart's ligament. Superficially, it was bounded on the inner side by a vertical line extended upward from the external abdominal ring; on the outer side by a vertical line touching the crest of the ilium, two inches behind the anterior superior spinous process; below by a curved line with its greatest convexity three-quarters of an inch below Poupart's ligament; and above by a similar line, having its greatest convexity midway between Poupart's ligament and the umbilicus. The tumour was exceedingly sensitive, but, although tolerably firm, it diminished considerably in size under steady pressure, speedily regaining its size when the pressure was removed. Pulsation was marked and expansile, and a well-marked systolic murmur was audible over its surface, being most intense over the normal line of the external iliac artery—this vessel being, however, as was afterwards discovered, deflected inward far beyond its usual position. Pulsation of the left anterior tibial artery was detected, but that of the femoral, popliteal, and posterior tibial was absent. Pain in the left thigh and groin was severe and constant, and the patient's general condition was unfavourable, the temperature being from 101 to 103, and the appetite and digestion poor.

In consequence of the fact that the chief bulk of the tumour, so far as it could be felt through the anterior abdominal wall, lay external to the course of the iliac arteries, I felt doubtful whether the disease was aneurismal or malignant. I therefore determined to explore the rectum, and on Oct. 13th, having administered ether, and placed the patient on his back at the foot of the bed, I carefully inserted my left hand, when I readily ascertained that the tumour was of greater extent than the external examination had led me to suppose. It dipped into the cavity of the pelvis, overlapped somewhat the left common and internal iliac arteries, and carried before it, upon its inner surface, the external iliac artery, pressure on which completely arrested the pulsation of the tumour, which was unaffected when pressure was made on the internal, instead of the external, iliac. The latter circumstance seemed to favour the diagnosis of aneurism; for experience has shown that pulsating malignant growths, developed from the pelvic bones, are usually supplied with numerous arteries derived from several sources, and that in them pulsation is not always arrested by the compression of a single trunk. Pressure on the common iliac, like that on the external iliac, stopped both pulsation and murmur, but pressure on the internal iliac left these symptoms unaltered.

After completing the examination, I made pressure on the external iliac artery for forty minutes, being unable to continue the procedure for a longer period, on account of the unfavourable direction of the pressure, which had to be made outwardly, against the somewhat yielding substance of the tumour. Nothing was accomplished by the pressure, and the tumour, which had, about forty-eight hours previously, become rapidly larger, continued to increase after the rectal examination; so that, on Oct. 16th, it was found to overlap the crest of the ilium, and to reach within an inch of the umbilicus. Meanwhile the patient grew weaker and more restless, and was nearly deprived of sleep by pain.

Danger to life being imminent, and the case being evidently hopeless if left without surgical interference, I endeavoured to decide what plan of operation would best meet the existing emergency. So far as could be determined, the disease appeared to be aneurismal; yet the possibility of the tumour being a pulsating sarcoma, with extensive extravasation, could not be denied. This doubt alone would have made me hesitate before attempting the operation of laying open the tumour by incision; while, in any case, I feared that so severe a measure would prove disastrous, in consequence of the patient's enfeebled condition. The alternative of tying the external or the common iliac artery according to any of the usual methods was, after careful consideration, rejected as impracticable, on account of the size and situation of the tumour, which rendered it impossible to expose these vessels by lateral incisions through the abdominal wall, not involving the peritoneum. Finally, the information I had obtained while making manual exploration of the rectum suggested to me the only plan which seemed expedient under the circumstances. This examination had revealed the fact, that the external iliac artery had been carried by the growing tumour a little to the right of the median line of the body, and that pressure on the artery, as it lay strapped on the inner surface of the tumour, completely stopped its pulsation. I therefore thought

that an incision in the linea alba down to the peritoneum might enable me to separate that membrane, without wounding it, sufficiently to expose the artery where it coursed over the tumour, and where it might, perhaps, be conveniently tied. Failing in this attempt, I could, by opening the peritoneum, obtain ready access to the pelvic vessels, and apply a ligature at whatever point seemed most favourable.

The plan thus sketched having received the approbation of my colleagues, I performed the following operation on October 17th. Ether having been administered, I made an incision in the median line, from the umbilicus to the symphysis pubis. The peritoneum, when reached, was readily stripped from the abdominal wall, and to some extent from the tumour, to which, however, it was so adherent, that I thought it best to make a free opening into the abdominal cavity. When this had been done, it was found that ligation of the external iliac artery would be impracticable. The lower part of this vessel was unhealthy in appearance, and was deeply imbedded in the tumour, while the upper part was so covered by, and blended with it, as to be altogether inaccessible. I therefore applied a ligature to the common iliac artery, about an inch above its point of bifurcation. This was accomplished with difficulty, the artery being concealed by the tumour, and adherent to it, and to the ureter, which was much enlarged, and was at first mistaken for an artery. The common iliac vein was not seen, but was carefully avoided when passing the aneurism needle, which had to be guided by the finger rather than by the eye. The ligature used was a piece of stout carbolized catgut—E violin string—and was tightened with sufficient force to divide the internal and middle coats of the artery. Both ends of the ligature were cut off about half an inch from the knot, the intestines were replaced, and a rubber drainage tube was inserted to the bottom of the wound, which was closed with interrupted silver sutures, embracing the peritoneum. In performing the operation, all the details of Lister's method were observed, except the employment of carbolized silk sutures, for which silver wire was substituted. After it was finished, the patient was placed on a water-bed, and the limb enveloped in cotton wadding. Rather unexpectedly, he rallied well from the operation, and his general condition improved steadily for some time afterward. The deep parts of the wound united by adhesion, while superficially, corresponding with the lower half of the incision, the integument failed to unite, and its retraction left an oval ulcer that healed very slowly by granulation. The drainage-tube was shortened on the eleventh, and removed on the fourteenth day. The abdominal wound was completely closed on December 9th; but on Jan. 1st the cicatrix softened, causing a sluggish ulcer which lasted five weeks, at the end of which time firm closure was obtained. Meanwhile, the patient became much reduced, in consequence of gangrene of the left foot and leg, which commenced a few days after the operation. The gangrene was quite dry, and involved the entire thickness of the limb as high as a line three inches above the ankle, beyond which there occurred at a later period, mortification of a narrow strip of integument, apparently due to pressure on the fibula, the leg having rested for many weeks upon its outer side. In consequence of the existence of a bedsore, diarrhœa, vomiting, and other signs of debility, no favourable opportunity for amputation occurred until Jan. 14th, when I removed the limb just above the knee, employing the circular method of operation, and, to avoid slough-

ing, separating the integument to an extent not exceeding half an inch. By cutting and detaching the muscles, the bone was exposed for section at a high point, and an excellent stump was left, which was firmly cicatrized three weeks after the amputation. This operation, like the first one, was performed according to Lister's antiseptic method, to which I am disposed to attribute, in a large measure, the remarkably good behaviour of the wounds, notwithstanding the low vitality of the patient.

After the operation of tying the iliac artery, the pelvic tumour became firmer, and steadily diminished in volume, becoming, after the lapse of three months, reduced to a small, hard mass, that barely filled the iliac fossa, and caused no projection of the abdominal wall. There can now be no doubt that the tumour was an aneurism, and that the cure effected is radical and complete. The patient's general health improved rapidly after the last operation, and the deep, as well as the superficial part of the wound, united almost entirely by primary adhesion.

Wishing to avoid the recital of details that might be wearisome, I have omitted many facts which are stated in the hospital records. An inspection of these records will show that, although the operation-wounds did well, the patient's general condition was often such as to excite serious apprehension that he would die from exhaustion; and I am quite certain that his recovery could not have been secured without the vigilant and skilful care bestowed upon him, during his protracted illness, by the gentlemen of the house-staff, aided by the excellent nurses of the hospital-training school.

In reviewing the case, which thus terminated favourably under most unpromising circumstances, I see no reason to regret the course of treatment pursued. Gangrene might, perhaps, have been avoided by ligating the external, instead of the common iliac artery, but the reasons why this was deemed inexpedient have been already stated, and appear to me conclusive. It is noteworthy, that the mortification was of the dry variety, the doomed parts dying very slowly, and becoming mummified as in cases of senile gangrene. This fact would seem to imply the absence of any interference with the venous circulation of the limb, either from the aneurism or the operation. Doubtless, the ligature of the artery in one way favoured the return of venous blood, by relieving the veins of the pressure of the aneurism, a marked subsidence of which, as well as diminished tension, was noticed immediately after the operation.

In this case, as in the one first related, manual exploration of the rectum afforded important information that could not be otherwise obtained. It threw light on the diagnosis, pointed out the vessel from which the tumour was developed, and demonstrated that the relations of the iliac arteries to the aneurism were such as, even apart from its unusual dimensions, would render futile an attempt to reach these arteries by the ordinary methods of operation. Even with the advantages of a median incision, and with a free division of the peritoneum, I found it very difficult to safely surround the vessel with a ligature, and some rough handling of the intestines was

unavoidable. The case affords another illustration of the impunity with which the peritoneum may be opened, and suggests the inquiry whether, in any case presenting unusual difficulties in the operation of tying the iliac arteries by the customary method, the one here adopted might not deserve the preference. I have witnessed fatal cases, in which I thought that death resulted from extensive separation of the peritoneum, combined with the stretching and bruising of the tissues found necessary to expose the artery; and I believe that such cases would have a better chance of success if the artery were directly exposed by a careful division of the peritoneum in the median line. The dangers attending such a procedure must, I think, be greatly lessened by the employment of an antiseptic animal ligature; and the case which I have narrated proves that catgut, if properly selected and prepared, is capable of permanently arresting the circulation through the largest artery which is likely to require ligation.

ARTICLE VI.

WHAT IS THE EXPLANATION OF THE PROTECTION FROM SUBSEQUENT ATTACKS, RESULTING FROM AN ATTACK OF CERTAIN DISEASES, AND OF THE PROTECTIVE INFLUENCE OF VACCINATION AGAINST SMALLPOX?
By GEORGE M. STERNBERG, M.D., Surgeon U. S. A.

IN a majority, if not in all, of those diseases in which one attack is protective, we have an increase of the specific poison within the bodies of the sick, as is proved by the fact that the disease is communicated by them. The hypothesis which is, perhaps, most in favour with medical writers of the present day to account for the protection furnished by a single attack of these contagious maladies, is that which assumes that some material present in the blood or tissues of unprotected individuals is exhausted during the attack, and that when again exposed to the poison, the individual is no longer susceptible to its influence, as the pabulum necessary for its increase is no longer present in his system.

This hypothesis is sustained by Pasteur (*Sur le Choléra des Poules, Comptes Rendus Acad. des Sc.*, xc. pp. 952-958) to account for the protection afforded by inoculation with "attenuated virus"—compared to vaccination—which fowls enjoy from the disease known as chicken cholera. As the arguments used by Pasteur, based upon carefully conducted experiments, are probably the strongest that could be adduced in favour of the hypothesis referred to, I shall give them in detail, and will afterwards state my reasons for venturing to differ from this distinguished savant, and the facts which induce me to give preference to a different explanation of the phenomenon in question. The following are the conclusions of Pasteur:—

"It is the life of a parasite in the interior of the body which produces the malady commonly called '*choléra des poules*,' and which causes death. From the moment when this culture [*i. e.*, the multiplication of the parasite] is no longer possible in the fowl, the sickness cannot appear. The fowls are then in the constitutional state of fowls not subject to be attacked by the disease. These last are as if vaccinated from birth for this malady, because the fetal evolution has not introduced into their bodies the material necessary to support the life of the microbe; or these nutritive materials have disappeared at an early age.

"Certainly we should not be surprised that there may be constitutions sometimes susceptible and sometimes rebellious to inoculation—that is to say, to the cultivation of a certain virus, when, as I have announced in my first note (*l. c.* pp. 239–248), one sees a preparation of beer yeast made exactly like one from the muscles of fowls (*bouillon*) to show itself absolutely unsuited for the cultivation of the parasite of chicken cholera, while it is admirably adapted to the cultivation of a multitude of microscopic species, notably to the *bactéridie charbonneuse*. (*Bacillus anthracis*, Koch.)

"The explanation to which these facts conduct us, as well of the constitutional resistance of some individuals, as of the immunity produced by protective inoculations, is only natural when we consider that every culture, in general, modifies the medium in which it is effected; a modification of the soil when it relates to ordinary plants; a modification of plants or animals when it relates to their parasites; a modification of our culture liquids when it relates to *mucédines*, *vibrioniens*, or ferments.

"These modifications are manifested and characterized by the circumstance that new cultivations of the same species in these media, become promptly difficult or impossible. If we sow *chicken-bouillon* with the microbe of cholera, and, after three or four days, filter the liquid in order to remove all trace of the microbe, and subsequently sow anew, in the filtered liquid, this parasite, it will be found quite powerless to resume the most feeble development. The liquid, which is perfectly limpid after being filtered, retains this limpidity indefinitely.

"How can we fail to believe that by cultivation in the fowl of the attenuated virus, we place its body in the state of this filtered liquid, which can no longer cultivate the microbe? The comparison can be pursued still further; for, if we filter the *bouillon* containing the microbe in full development, not on the fourth day of the culture, but on the second, the filtered liquid will still be able to support the development of the microbe, although with less energy than at the outset. We comprehend, then, that after a cultivation of the modified (*attenué*) microbe in the body of the fowl, we may not have removed from all parts of its body the aliment of the microbe. That which remains will permit, then, a new culture, but in a more restricted measure.

"This is the effect of a first inoculation; subsequent inoculations will remove progressively all the material necessary for the development of the parasite.

"Is this the only possible explanation of the phenomenon? No, we may admit the possibility that the development of the microbe, in place of removing or destroying certain matters in the bodies of the fowls, adds, on the contrary, something which is an obstacle to the future development of this microbe. The history of the life of inferior beings authorizes such a supposition. The excretions resulting from vital processes may arrest vital processes of the same nature. In certain fermentations we see antiseptic products make their appearance during, and as a result of, the fermentation, which put an end to the active life of the ferments, and arrest the fermentations long before they are completed. In the cultivation of our microbe, products may have been formed the presence of which, possibly, may explain the protection following inoculation.

"Our artificial cultures permit us to test the truth of this hypothesis. Let us prepare an artificial culture of the microbe, and after having evaporated it *in vacuo*, without heat, let us bring it back to its original volume by means of fresh *chicken bouillon*. If the extract contains a poison for the life of the microbe, and if this is the cause of its failure to multiply in the filtered liquid, the new liquid should remain sterile. Now, this is not the case. We cannot, then, believe that during the life of the parasite certain substances are produced which are capable of arresting its ulterior development."

The last hypothesis advanced by Pasteur as the only alternative of the one first offered, seems to be disproved by the experiments cited, so far as chicken cholera is concerned; and in the case of vaccination we can hardly conceive that an antiseptic substance can be produced, during the development of the vaccine vesicle, in such quantity as to protect the individual for years, or for life, from the effects of the smallpox virus. We may, then, dismiss this hypothesis; but, as I shall endeavour to show shortly, this does not leave us without any alternative but to accept the hypothesis first offered, viz., the exhaustion of some material necessary to the development of the poison germ, bioplast, or whatever it may be, in the system of man or animals, by a single attack of any one of the specific diseases.

Let us see where this hypothesis leads us. In the first place, we must have a material of smallpox, and a material of measles, and a material of scarlet fever, etc. etc., for an attack of one of these diseases does not protect from any of the others. Then we must admit that each of these different materials has been formed in the system and stored up for these emergencies—attacks of the diseases in question—for we can hardly conceive that they were all packed away in the germ-cell of the mother and the sperm-cell of the father of each susceptible individual. If, then, these peculiar materials have been formed and stored up during the development of the individual, how are we to account for the fact that no new production takes place after an attack of any one of the diseases in question?

Again, how shall we account for the fact that the amount of material which would nourish the smallpox germ to the extent of producing a confluent case of smallpox may be exhausted by the action of the attenuated virus introduced by vaccination? Pasteur's comparison of a fowl protected by inoculation with the parasite of chicken cholera, with a culture fluid in which the growth of a particular organism has exhausted the pabulum necessary for the development of additional organisms of the same kind, does not seem to me to be a just one, as in the latter case we have a limited amount of nutriment, while in the former we have new supplies constantly provided of the material—food—from which the whole body, including the hypothetical substance essential to the development of the disease-germ, was built up prior to the attack. Besides this, we have a constant provision for the elimination of effete and useless products.

This hypothesis, then, requires the formation in the human body, and the retention up to a certain time, of a variety of materials, which, so far as we can see, serve no purpose except to nourish the germs of various specific diseases, and which, having served this purpose, are not again formed in the same system, subjected to similar external conditions, and supplied with the same kind of nutriment.

The difficulties into which this hypothesis leads certainly justify us in looking further for an explanation of the phenomenon in question.

This explanation is, I believe, to be found in the peculiar properties of the protoplasm, which is the essential framework of every living organism. The properties referred to are: the tolerance which living protoplasm may acquire to certain agents which, in the first instance, have an injurious or even fatal influence upon its vital activity, and the property which it possesses of transmitting its peculiar qualities, inherent or acquired, through numerous generations, to its offshoots or progeny.

There can be but little doubt that protoplasm is the essential living portion of the cellular elements of animal and vegetable tissues, but as our microscopic analysis of the tissues has not gone beyond the cells of which they are composed, and is not likely to reveal to us the complicated molecular structure of the protoplasm upon which, possibly, the properties under consideration depend, it will be best for the present purpose to limit ourselves to a consideration of the living cells of the body. These cells are the direct descendants of pre-existing cells, and may all be traced back to the sperm-cell and germ-cell of the parents. Now, the view which I am endeavouring to elucidate is, that during a non-fatal attack of one of the specific diseases the cellular elements implicated which do not succumb to the destructive influence of the poison, acquire a tolerance to this poison which is transmissible to their progeny, and which is the reason of the exemption which the individual enjoys from future attacks of the same disease.

The known facts in regard to the hereditary transmission, by cells, of acquired properties, make it very easy to believe in the transmission of such a tolerance as we imagine to be acquired during the attack, and if it is shown by analogy that there is nothing improbable in the hypothesis that such a tolerance is acquired, we shall have a rational explanation, not of heredity and the mysterious properties of protoplasm, but of the particular result under consideration.

The transmission of acquired properties is shown in the budding and grafting of choice fruits and flowers, produced by cultivation, upon the wild stock from which they originated. The acquired properties are transmitted indefinitely, and the same sap which on one twig nourishes a sour crab-apple, on another one of the same branch is elaborated into a delicious pippin.

Numerous examples in illustration of the same fact may be drawn from the animal kingdom; thus, the same mother may give birth to two children by different fathers; the one may inherit a predisposition to consumption, and the other to insanity; and this inheritance, which only manifests itself at the end of many years, has been transmitted from the original sperm-cells of the respective fathers through countless generations of cells which have lived and died, leaving their progeny to perform their functions.

The immunity which an individual enjoys from any particular disease

must be looked upon as a power of resistance possessed by the cellular elements of those tissues of his body which would yield to the influence of the poison in the case of an unprotected person. There is every reason to believe that it is upon the living portion of the tissues, or the protoplasm of the body, that the disease-poisons act; for if it were upon non-living matter—formed material, Beale—and we had to deal only with chemical phenomena, it would be impossible to account for the fact that like causes do not always produce like results. On the other hand, the resistance of living matter to certain destructive influences is a property dependent upon vitality. Thus, living protoplasm resists the action of the bacteria of putrefaction, while dead protoplasm quickly undergoes putrefactive changes. Again, it seems probable that in conditions of debility from age, sickness, starvation, or any other cause, the vital resisting power of the protoplasm is reduced, and certain agents which, under more favourable conditions, would be powerless for harm, may overcome this vital resistance.

The tolerance to narcotics, opium, tobacco, etc., resulting from a gradual increase of dose, may be cited as an example of acquired tolerance by living protoplasm to poisons, which at the outset would have been fatal in much smaller doses. There can be little doubt that in this instance it is the living protoplasm of the nervous tissues upon which the poison acts to produce its characteristic effects.

But it is in the specific diseases in which a single attack proves protective that I find the best proof that the cellular elements of the body may acquire a tolerance during the attack which being transmitted to their cellular progeny furnishes the protection which the individual enjoys.

Let us take a particular case. In yellow fever the immediate effect of the poison seems to be to arrest vital processes generally—nutrition, secretion, excretion—and in fatal cases we find that the protoplasm of various organs and tissues has undergone degenerative changes; this is especially true of the liver-cells. Now, we have every reason to believe that this occurs in a less degree in non-fatal cases, but that a sufficient number of cells having resisted the destructive influence of the poison, and become accustomed to its presence, resume their functions, and that thus the vital processes upon which the life of the individual depends are again carried on in the very presence of the poison, which at first paralyzed or destroyed the vital activity of certain cells. The case is more striking in smallpox, in which there is an undoubted increase of the poison in the tissues during the progress of the disease, but in the first-mentioned disease the patient commonly remains during his sickness in the infected atmosphere, the breathing of which produced the attack from which he is suffering.

The protection from yellow fever resulting from acclimation—if, indeed, there is such a thing as acclimation independent of an attack of the disease—seems to be a tolerance acquired by repeated exposure to the poison in quantities not sufficient to produce an attack.

The tolerance enjoyed by the negro race to the malarial poison is probably the result of long residence in malarious regions. Natural selection has doubtless come into play here in establishing this tolerance as a race peculiarity.

I would, then, place acclimation, inoculation by attenuated viruses, and an attack of any one of the specific diseases, all in the same category so far as the explanation of the protection afforded is concerned; and, according to my view, the explanation of this phenomenon is to be found in the peculiar properties of living protoplasm which enable it, within certain limits, to adapt itself to varying conditions and injurious influences, and to transmit the impression or modification received in so doing, to its offshoots, which continue to perform its functions during the life of the individual.

ARTICLE VII.

OÖPHORECTOMY FOR FIBROID TUMOURS OF THE UTERUS. By G. H.
BALLERAY, M.D., of Paterson, New Jersey.

THAT oöphorectomy is destined to be the operation of the future in cases of bleeding fibroid tumour of the uterus, which has resisted all other treatment, which is not susceptible of removal through the vagina, and in which it is evident, that, unless the hemorrhage is arrested, the patient must inevitably perish, can hardly admit of a doubt.

The study of the natural history of cases of uterine fibroid has shown, that, after the menopause, it often ceases to trouble the patient, gradually dwindles away, and finally entirely disappears. It is therefore not to be wondered at that the idea should have suggested itself to surgeons to endeavour to bring about this condition artificially by the removal of the ovaries. It is often a difficult matter to decide upon the proper time for the performance of the operation, inasmuch as, in many cases, after the patient has been reduced to a condition of extreme anæmia from profuse hemorrhage, there is a temporary improvement, which is generally attributed to the use of some one of the fashionable remedies for these cases, which, in all probability, has nothing whatever to do with it. In consequence of these deceptive lulls, the operation is sometimes postponed until the patient is reduced to such a condition of weakness that any operation would be attended by more than the usual danger. The blind faith in drugs which some men exhibit, is to me incomprehensible. How an intelligent physician can go on month after month, pouring medicine into the stomach of a patient who is slowly but surely dying of hemorrhage from a uterine fibroid, is difficult to understand.

The hypodermic injection of ergotine is also sometimes persisted in for

months, when it is evident that it is not doing the slightest good. To thus persist in the use of ineffectual remedies, which involve a loss of valuable time, is highly reprehensible. Therefore, while I would not advocate a resort to surgical interference so long as the hemorrhage can be kept in check by rest in the recumbent posture and the administration of those drugs which are theoretically indicated, and which, as claimed by some, not only diminish the hemorrhage, but actually diminish the size of the tumour, I would most earnestly advise a resort to surgery, before the patient is almost moribund, in those cases in which, notwithstanding the use of the most approved remedies, the patient is steadily getting worse. I have lately seen a case of uterine fibroid in which Mr. Knowsley Thornton performed oöphorectomy successfully. The patient had been allowed to get into a condition of extreme exhaustion from metrorrhagia before Mr. Thornton saw her. Although this patient recovered, I think her recovery is to be attributed more to good luck than good management, so far as her attending physician is concerned. In one of Mr. Tait's fatal cases of oöphorectomy for uterine fibroid, the patient was actually moribund from repeated hemorrhages when the operation was performed. I know of another case, which has been seen in consultation by one of the most skilful ovariologists in London, but that gentleman declined to operate because the patient was so weak, from long-continued loss of blood, that he feared she would die on the operating table. Why, in a city like London, which can boast of several of the most skilful ovariologists in the world, a patient should be allowed to get into a condition (to which she has been gradually tending for months) of such extreme prostration as to deter a most skilful and courageous operator from giving her the only chance for her life by an operation which, if done earlier, probably would have been successful, is a question hard to answer. But it would seem as though there must have been either gross ignorance or wanton dereliction of duty on the part of somebody.

The duty of the surgeon in these desperate cases seems to me to be perfectly clear. The rule by which he should be governed is this: If without an operation the patient *must* die, and if an operation holds out any hope of success, however slight, and if the patient, understanding the facts of the case, elect the operation, it is the *duty* of the surgeon to perform it. By acting in accordance with this rule, the surgeon may occasionally subject himself to the charge of being rash, his decision and courage being mistaken for temerity, but no *true* surgeon should ever hesitate to hazard his reputation in the performance of professional duty.

Having thus far spoken in favour of the operation in suitable cases, I will now refer to the difficulties which often attend its performance, and I believe that these can best be illustrated by citing cases which have come under my own observation.

In the early part of last month I saw Mr. Thornton attempt to perform oöphorectomy in a case of uterine fibroid. The tumour reached to the umbilicus. The usual abdominal incision was made, and the left ovary brought into view, transfixed, tied, and removed without difficulty. There was no great difficulty experienced in reaching the right ovary, but its pedicle was short, and in drawing upon it so as to bring the ovary into view sufficiently to enable him to transfix and tie the pedicle, Mr. Thornton had the misfortune to split the peritoneal covering of the uterus and open some enlarged veins lying immediately beneath it. Free hemorrhage followed, which he endeavoured in vain to control by passing a needle, armed with a ligature, beneath the veins and ligating them; but every puncture of the needle was followed by increased bleeding. The abdominal incision had been extended above the umbilicus, and the uterus, with the tumour, turned out of the incision so as to expose thoroughly the part from which the hemorrhage proceeded. The actual cautery was now applied, but with no better result, the blood continuing to well up in streams from the wounded veins. Finding that there was no alternative, Mr. Thornton proceeded to extirpate the tumour with a portion of the uterus. A semicircular incision from below upwards, on the right side, was quickly made down to the tumour, and the latter raised from its bed by passing the fingers beneath it and enucleating it. Its removal was then accomplished by another incision on the opposite side, similar to the first, making, as it were, a double flap operation. The uterine cavity was not opened. After the bleeding vessels had been secured, the uterine wound was closed by the *uninterrupted* suture, and the uterus replaced in the abdominal cavity. The woman died on the *third* day after the operation, partly from septicæmia.

The operation was commenced after 4 P. M., and by the time that it became evident that the tumour must be removed it was nearly dark; in fact the operation was finished by candlelight; consequently Mr. Thornton hurried through the final steps of the operation more than he otherwise would have done. To this may be attributed the subsequent internal hemorrhage which proceeded from vessels which had ceased to bleed while the patient was under the influence of the anæsthetic, and which might have been more efficiently secured had there been more time and a better light to work by. In another case in which the same accident happened to Mr. Thornton during the operation of oöphorectomy, he performed hysterectomy with a successful result.

Three weeks ago I saw Dr. Geo. Granville Bantock perform oöphorectomy at the Samaritan Hospital in a case of fibroid tumour of the uterus.

The tumour reached to within an inch and a half of the umbilicus. The usual incision was made, and the left ovary removed without difficulty. The removal of the second ovary, however, was found impracticable. The pedicle was very short, and the ovary was lying directly behind the uterus, and at first could not be felt. After enlarging the incision up to the umbilicus, Dr. Bantock introduced his hand into the abdomen and passed it as far behind the tumour as possible; but he could barely feel the ovary, which seemed small and atrophied. Finding that it was impossible to reach the ovary without using unjustifiable force, Dr. Bantock closed the incision and put the patient to bed. The ovary which

was removed contained a Graaffian follicle just about to rupture. The subsequent progress of this case was very satisfactory. The temperature never rose above 101° , and only reached that point for a few hours on the second day after the operation. At the menstrual period following the operation the patient lost very little blood; it is, therefore, to be hoped that the ovary which was removed was the active organ, and that the other being atrophied the operation will prove a success.

If the operation of oöphorectomy, in cases of fibroid tumour of the uterus, presents difficulties which tax to the utmost the skill and judgment of such operators as Bantock and Thornton, I hope that it is scarcely necessary for me to caution less skilful and less experienced professional brethren against undertaking the performance of this operation without a due appreciation of their own responsibilities, and without a distinct understanding on the part of the patient or her relatives of the difficulties¹ and dangers of the operation. As to the method of performing the operation my own preference would certainly be in favour of *abdominal* section. Oöphorectomy by *vaginal* section, as suggested by Goodell, will be found impracticable in the vast majority of cases of uterine fibroid requiring the removal of the ovaries. I cannot see the wisdom of the recommendation of Dr. Goodell to attempt the removal of the ovaries through the vagina *first*; and failing in that to proceed to remove them by abdominal section. It certainly cannot be advisable to subject a patient to two operations if one will suffice. If abdominal section is the best adapted to the most difficult cases, then it follows that it is the best in *all* cases; for one never can tell beforehand what difficulties we may encounter in any given case.²

If Dr. Goodell had the fear of wounding the peritoneum before his eyes when he advised the vaginal in preference to the abdominal section, then I must say that I think his fears are groundless. The experience of all ovariologists tends to prove that *traumatic* peritonitis is *exceedingly rare*; and Mr. Lawson Tait, whose experience in oöphorectomy is probably greater than that of any other surgeon, informs me that he has never lost a patient, after that operation, from traumatic peritonitis.

My object in the foregoing pages has been to urge upon my professional brethren the *necessity* of oöphorectomy in cases of uterine fibroma attended

¹ An interesting case illustrating the difficulties of this operation, reported by Dr. M. D. Mann, of Hartford, Conn., will be found in the *American Journal of Obstetrics*, Oct. 1880.

² I do not wish to be understood as asserting that vaginal oöphorectomy is *never* preferable to oöphorectomy by abdominal section. I have recently seen several cases of prolapsed ovaries, with chronic ovaritis and retroflexion of the uterus, which have caused great and prolonged suffering, and which have not been amenable to treatment. In these cases the question was raised by the medical attendant as to whether or not oöphorectomy would be justifiable. I believe it would, and that the operation by vaginal section might possibly, in these cases, be preferable to that by abdominal section.

by profuse hemorrhage, before the patient is reduced to such a condition that the operation can only be undertaken as a *forlorn hope*, and, at the same time, to call attention to the difficulties of the operation and the necessity, or at least advisability, of informing either the patient or her relatives of its possible dangers.

LONDON, Nov. 15, 1880.

ARTICLE VIII.

SOME POINTS IN THE PATHOLOGY OF OCULAR LESIONS OF CEREBRAL AND SPINAL SYPHILIS, ILLUSTRATED BY CASES. By CHARLES STEDMAN BULL, A.M., M.D.; Lecturer on Ophthalmology in the Bellevue Hospital Medical College, New York; Surgeon and Pathologist to the New York Eye Infirmary.

LESIONS of the eye and its extrinsic muscles, functional and organic, due to syphilis, and having their origin located in the brain and spinal cord, have been known for many years, and isolated cases have been reported as far back as the middle of the last century, though the clinical history of such cases is very defective, and their pathology either very faulty or entirely ignored. Of late years, however, this subject has been more and more carefully studied from a true scientific standpoint, and it is mainly to the labours of Hughlings Jackson, Lancereaux, and especially of Fournier, and Mauriac, that we owe our knowledge of the pathology of syphilis of the nerve centres with peripheral manifestations. We know now that these ocular symptoms may be developed at any age of the so-called tertiary period, but also that they may be more or less precocious, occurring not infrequently within the first year of constitutional infection, and sometimes as early as the third or fourth month. On the other hand they may be postponed to a very late period, and cases have been reported where the interval between the occurrence of the initial lesion and the appearance of ocular lesions has been twenty years and more, and where no suspicion has been excited of the patients having contracted the disease *de novo*. According to recent statistics cerebral syphilis seems to be most frequent between the third and the eighteenth year after infection, and of all the symptoms of this variety of syphilitic lesion, there are probably none so frequent as those of paralysis of the cranial nerves. Of these, the most common are paralyses of the oculo-motorius, and these are followed in the order of frequency, by paralyses of the optic, auditory, and facial nerves, and at a longer interval by paralyses of the olfactory and trifacial. It is the belief of the writer that these ocular paralyses are frequently the initial symptom of cerebral syphilis. Of course there are instances where the paralysis is only the consequence of a peripheral lesion, as in cases where only one ocular muscle is paralyzed, but these cases are not common and they are excluded from consideration here.

The oculo-motor nerves are more exposed than other cranial nerves to be attacked by intra-cranial lesions, because they run a long course at the base of the skull before entering the orbit, in contact with the meninges and over a bony floor, and in a region where syphilitic intra-cranial lesions are most common.

Syphilitic paralyses of the ocular muscles are generally insidious and rapid in their onset, without being sudden, though they are not always so. There may be frequent though transient attacks of diplopia before the paralysis becomes finally established, and the paralytic phenomena may be preceded by fleeting attacks of headache. Moreover the paralyses are very often incomplete, so that the patient complains of diplopia, though no squint is visible, and the paralysis can then only be determined by testing the eyes with coloured lights or coloured glasses, or the other methods ordinarily in use for deciding which muscle or group of muscles is affected. Paralysis of the third nerve may affect only certain branches of the nerve, or even a single branch; for we may meet with paralysis of the levator palpebræ and superior rectus, or paralysis of the internal rectus alone, or of the superior rectus, alone; or there may be ptosis alone, or in rarer cases there may be mydriasis, with or without paralysis of accommodation, no extrinsic muscle being involved.

We also know that one or more groups of ocular muscles may be paralyzed by a syphilitic cerebral lesion, for both third nerves may be affected, or the third nerve of one eye and the sixth nerve of the other. Finally there are some rare cases in which all the motor nerves of both eyes are found involved. According to Fournier motor paralyses of the ocular muscles have a double significance: 1st. They furnish strong suspicion of the existence of syphilis as a cause; and 2d. They announce an imminent danger in revealing an intra-cranial lesion, which may extend and attack the cerebral centres. Ricord goes even farther than this, and considers that paralyses of the motor nerves of the eyes are positive signs of syphilis; a statement altogether too sweeping in its character, and the truth of which is contradicted almost daily. That they occur very frequently in syphilis is however well known, the proportion being about 75 per cent. The liability of these nerves to become involved in any process at the base of the brain or skull, especially of an inflammatory nature, while due as already stated to their topographical anatomy, is also enhanced by the fact that they are surrounded for a certain distance in their course by an external sheath which is a prolongation of the dura mater, and by an inner fibro-cellular sheath which is a prolongation from the pia mater. Now when either or both of these membranes become inflamed, the resulting hyperplasia causes a thickening of these sheaths, the nerve is compressed and strangulated, degenerates and eventually atrophies. This is the pathology of not a few of the cases of motor paralysis in the eye, following some form, probably inflammatory, of cere-

bral syphilis. As regards the value of motor paralysis of the ocular muscles as an evidence of constitutional syphilis, in the absence of other symptoms, the question is by no means settled. We may be aided in the diagnosis if the patient is the subject of a paralysis of disconnected muscles, as in the case of ptosis with paralysis of the superior oblique muscle. A symmetrical paralysis cannot be regarded as proof of a syphilitic origin, for symmetry and uniformity are not always special attributes of syphilis in any of its stages. Dowse mentions, among the protean manifestations of nerve syphilis, its instability of character and its tendency to spontaneous resolution, both of which have been often seen in the domain of the ocular muscles; and he mentions having seen a pseudo-ptosis and contraction of the pupil in a case where the third nerve was probably not directly affected, due probably to syphilitic disease of the dura mater. The writer has seen in several cases of constitutional syphilis a transient ptosis of one side passing off in a few hours or days and giving place to a ptosis of the opposite side, accompanied by partial paralysis of the internal rectus of the corresponding eye, and Dowse states that a not uncommon symptom in the early period of cerebral syphilis is a divergent squint of one eye, followed in twenty-four hours by complete muscular co-ordination, to be succeeded later by complete paralysis of one or more muscles.

In the majority of cases paralysis of the extrinsic muscles of the eye, excluding those caused by lesions in the orbit and optic foramen, which are due to bone disease, are produced by some trouble at the base of the brain, usually in the meninges, of a diffuse or circumscribed inflammatory character. This is usually, though not always, caused by a neoplastic growth, which may be either a sclerosis or a gumma, the histological character of both being a hyperplasia of the cellular elements. The sclerosis is probably the result of rapid proliferation which ends in a permanent development of fibrous tissue. This may occur on the meninges, or along the vessels, or in and around the nerve fibres. The gumma is also a proliferation of the cellular elements of slower growth, and perhaps lower organization, and according to some authorities carries with it a tendency to degeneration, which under treatment ends in a granular or fatty condition, and its elements are then absorbed. Fournier regards meningeal sclerosis as the more common form, and says that though it involves the dura and pia mater, the arachnoid is very rarely affected. Our knowledge of meningeal gummata is still in an extremely unsatisfactory state. It is probable that they are oftenest met with in the dura mater, and that their habitual seat is at the base of the brain, between the optic chiasm and the basilar fossa. But they have been known to occur on the convexity of the hemispheres and to be accompanied by ptosis, without any discoverable lesion at the base. Fournier describes two forms, one a circumscribed tumour, and the other a diffuse infiltration like a membrane,

which reminds one of meningeal sclerosis rather than a gumma. Another point in pathology is that post-mortem examinations of patients who have died with all the symptoms of meningeal gummata, show no gummata whatever, but do show cicatrices where the gummata were supposed to have been, either as depressions in the dura mater, or as cicatricial bands in and upon the dura and sometimes in the convolutions. The occurrence of the sclerosed process in the meninges or in the sheaths of the cranial nerves is the probable explanation of the reason why some cases of motor paralysis of the muscles of the eye are never benefited by antisypilitic treatment, even when carefully and systematically carried out. The patients do not apply early enough for treatment, the nerves are compressed more and more by the contracting process of the sclerosed tissue and finally become incapable of performing their functions from atrophy.

While most ocular paralyses of syphilitic origin are due to a meningeal lesion at the base, it cannot be denied that they may result from circumscribed lesions at certain points of the gray matter of the convolutions, and this is especially so with paralysis of the levator of the lid. That gummy encephalitis is ever diffuse is doubtful, though Fournier admits its existence. Even here where the brain substance is the seat of a gumma, the latter occurs oftener in the anterior lobes and nearer the base than elsewhere. There may, however, be multiple gummata scattered through the brain, and in this sense the gummy encephalitis is disseminate.

As regards the period of constitutional taint at which paralyses of the ocular muscles appear, it does not seem possible to lay down any rule. The statement of Dowse, that the nervous system is rarely if ever affected by the syphilitic poison whilst in the secondary stage, the writer does not think can be accepted. The change from the secondary to the tertiary period is often so very rapid and ill-defined that the cases in which a paralysis of one or more ocular muscles of probably central origin has been found associated with a roseola, are by no means uncommon; and Dowse affirms that he has seen not a few cases in which cutaneous gummata have coexisted with a roseola maculata. Though true gumma of the brain has never been found at an autopsy to coexist with syphilitic roseola, yet a syphilitic meningitis ending in sclerosis may and does exist, in the belief of the writer, in the early secondary stage of syphilis.

A few words in regard to paralysis of individual or isolated muscles. These cases where only one ocular muscle is paralyzed, are not all due to central lesions. It is probable that in a small proportion of such cases, the lesion is an exostosis from the short canal of the optic foramen, or from the orbital wall which presses upon either the nerve filament supplying the muscle in question or upon the tendon of the muscle itself. But another possibility exists, which the writer does not recollect to have seen mentioned: and that is, the development of a gumma in the tissue of the muscle or in its sheath, which in its growth might produce a paralysis of

the muscle, partial if not complete, by continuous pressure. There is no case on record, so far as the writer is aware, of an intra-muscular gumma having been found, but the occurrence is possible, as these growths are not infrequent in muscles elsewhere in the body.

Visual troubles in cerebral syphilis are not so common as paralyses of the motor nerves. They may be due either to lesions of the cerebral parenchyma or to lesions at the base of the brain, whether meningeal or osseous. The lesions may be either directly inflammatory, or they may consist in the growth, perhaps slow and gradual, of a gumma. These lesions at the base may be either in the vicinity of the sella Turcica and optic chiasm, or far back near the centres of origin of the optic nerves. In either case, the optic nerves have been found at autopsies, compressed, degenerated, and atrophied, either by meningeal exudations, or by gummata or by cicatrices occupying the site of former gummata. But another cause of defective vision is to be found in a primitive intrinsic lesion of the optic nerves themselves, a primary atrophy or sclerosis of the optic nerve fibres *per se*, or, what is more frequent, a secondary simple sclerosis of the nuclei of origin, from sclerosis either of the neighbouring brain substance or of the spinal cord. The ophthalmoscope gives evidence in these cases of two different conditions in the ocular end of the optic nerve, one of optic neuritis, the papillitis varying in appearance from simple inflammation with slight œdema and swelling through all the stages up to true "choked disk," with or without hemorrhages, and ending in what is called inflammatory atrophy, with ragged and indistinct outlines; the other a simple white atrophy of the disk, with no signs of any preceding inflammation, and with the outline of the papilla perfectly clear and distinct. These ophthalmoscopic signs demonstrate the existence of a lesion situated in or about the course of the optic nerves at some point posterior to the eyeballs, and probably within the cranial cavity; an encephalic lesion, cerebral or meningeal. But they do not demonstrate anything more *precise* or *special* in regard to the *nature* or *location* of this lesion. They are the evidence of a grave lesion, which may lead to most serious consequences, because it is intra-cranial. The writer believes most earnestly that an ophthalmoscopic examination should always be made whenever a syphilitic patient begins to present symptoms which may be referred to cerebral syphilis, for a well-defined optic neuritis is by no means incompatible with the preservation of visual acuity.

Another interesting point in the pathology of optic neuritis is its chronicity in some cases, without progressive failure of vision. Since the meeting of the Fifth International Congress of Ophthalmology, in New York, in 1876, at which several cases were reported, instances of this kind have been not infrequently noticed. A patient will present himself with a syphilitic history and with the complaint that his vision has been failing for some months, but that lately he has not noticed any change. An

ophthalmoscopic examination shows an optic neuritis or a neuro-retinitis, with more or less swelling and œdema of the nerve and retina, but without the signs of true "choked disk." Repeated and long-continued observation of this case will disclose no change in the ophthalmic picture or in the functional examination of vision. One such case was under the observation of the writer for nearly three years, during which there was no demonstrable change in the fundus or in the vision, and Dr. Mathewson of Brooklyn has reported several such cases.

This optic nerve trouble may be the only ocular lesion of cerebral syphilis, or it may be accompanied by paralysis of one or more of the extrinsic muscles of the eye. Its coexistence with other manifestations of cerebral disease has also been noticed by neurologists, and special attention has been called by Hughlings Jackson to its connection with attacks of unilateral epilepsy. He thinks that the coexistence of these two forms of nerve lesions proves in the majority of cases the existence of a syphilitic lesion of the cerebral convolutions, and Fournier also coincides with this opinion.

CASE I. Paresis of Left Superior Rectus, Transient and Recurrent Ptosis; Paraplegia; Atrophy of Optic Nerves following Neuritis.—The patient was a gentleman, æt. 52, a merchant in active business life, who had contracted a venereal disease of some kind twelve years before. He was first seen by me in the summer of 1875. He stated that there were four or five small ulcers on the glans penis and inner surface of the prepuce, which remained unhealed for a long time, though he was under treatment for them. He had several eruptions of the skin, one of which was very general, and several attacks of sore throat. His alopecia had been at one period very marked. There had been an inflammation of the right eye seven years before I saw him, but of what nature it was impossible to say, as the media were clear and there were no patches of pigment upon the lens-capsule, after dilatation of the pupil by atropia. His health had been good even when he was suffering from the constitutional symptoms, but his business kept him very closely confined and was of a harassing nature. He was a moderate smoker, but did not touch alcohol in any form. About two months before I saw him he was suddenly attacked by slight dizziness while walking, and noticed that he saw everything double. When he closed the left eye the dizziness disappeared as did also the diplopia, but returned when both eyes were opened. The vertigo made him stumble, but with this exception he had no head symptom of any kind. In about a month he noticed a drooping of the left upper lid, which increased so far as to nearly cover the eye, and then the diplopia nearly disappeared. When I saw him there were nearly complete left ptosis, slight paretic action of the left internal rectus, and apparently complete paralysis of the left superior rectus. The accommodation was normal for his years, and the pupils were normal in size and reaction. R. E. $V=2\frac{1}{2}\%$, L. E. $2\frac{1}{2}\%$, unimproved by any glass. The media were clear, and there was nothing abnormal in the fundus, except a slight indistinctness in the outlines of the optic papillæ, and a hazy appearance of the left retina between optic disk and macula.

There was nothing abnormal in the heart except a slight feebleness of

beat, and the urine showed neither albumen nor casts, and was of normal reaction and specific gravity. In the absence of any graver cerebral symptoms, a very guarded prognosis was given, though from the syphilitic nature of the disease an unfavourable result was feared. As the patient was seen by me in consultation, I could merely indicate the line of treatment to be followed, and I believe a rigid and systematic anti-syphilitic treatment was persevered in for nearly eight months. I saw the patient from time to time, but could never note the slightest change in the paralysis of the ocular muscles, but shortly after his first visit his difficulty in walking became more marked than could be attributed to the diplopia. There was a slight stagger in the gait, he complained of numbness in his feet and ankles, and a loss of power in the legs; and all these symptoms slowly but steadily increased, until the spring of 1878, since which time he has been entirely paraplegic. At this period the vision began to fail somewhat rapidly, having previously remained unchanged from what it had been when I first saw him; and since April, 1880, he has been able merely to distinguish light from darkness. He was last seen by the writer on Sept. 25, 1880, when there was found absolute amaurosis, there being no perception of bright light. The paresis of the left superior rectus was still present, as well as the unilateral ptosis. There was entire loss of motion below the waist, and very marked anæsthesia as high as the fifth dorsal vertebra, though it was not complete. He was not able to lift his arms above the line of the shoulder, and he could with great difficulty move them across his chest, and scarcely at all backwards. The grasp of the hands was, however, very powerful, and he could still lift very heavy weights from the floor as he sat in a chair. The fingers, however, were flexed upon the hands and the hands upon the wrists. The muscles of the shoulders and scapular regions were markedly affected. The pupils were somewhat contracted and very sluggish, the media perfectly clear, and the optic disks were the seat of gray inflammatory atrophy, with ragged and indistinct outlines, and arteries reduced to mere threads. There were absolutely no head symptoms, the patient's memory was remarkably good, and his mind perfectly clear.

The pathological process induced by syphilis in this case was evidently a sclerosis, not general, but perhaps multiple, of the spinal cord and perhaps of the large ganglia at the base of the brain, most pronounced in the lower dorsal region, but beginning somewhere in the region of the nuclei of origin of the third cranial nerve. The first symptom of any central lesion was the paralysis of the superior rectus and levator palpebræ of one eye, followed by symptoms of spinal paralysis and atrophy of the optic nerves. The sclerosis in the spinal cord was steadily progressive, and was either ascending in its course, or else new foci of degeneration were developed from time to time higher up in the cord. The former supposition is the more probable. It is also probable that the process of degeneration has not attacked the brain, except at the base, as the mental faculties still retain their normal acuteness.

CASE II. *Paralysis of Right Third Nerve and Right Superior Oblique; Subsequent Simple White Atrophy of Optic Nerves.*—The patient was a man, æt. 50, in apparently good health, who had contracted the initial lesion of syphilis six years before. The constitutional symptoms had been

severe, especially those occurring in the skin and periosteum, but there had never been any affection of the eyes until nine months before I saw him. At that period, coincident with a general eruption upon the skin, he began to see double and the right upper lid began to droop. These symptoms rapidly grew worse, the eye soon turned out towards the temple, and the ptosis became complete. The right eye being thus excluded from vision, the diplopia disappeared, but he soon noticed that the vision of the right eye was failing, by closing the left eye, and lifting up the lid of the right eye. During the last two months he has complained of a dull pain in the right eye, and says that the right side of his face and head felt *numb*.

An examination showed complete paralysis of the right superior oblique and the branches of the right oculo-motorius, with secondary contraction of the right external rectus muscle. The pupil was moderately dilated and immovable. There was no anæsthesia of the cornea, but on the right side of the face and neck and on the right parietal region the sensibility was decidedly reduced. Ophthalmoscopically there was no abnormal appearance in either eye except a small sclero-choroiditis posterior. Vision in the R. E. was $\frac{15}{30}$, in the L. E. $\frac{15}{xv+}$.

This patient was immediately placed upon a strict anti-syphilitic treatment, his diet carefully regulated, and his use of tobacco entirely stopped, but there was no change produced in the paralytic condition of the ocular muscles, though the treatment was carried on for a period of ten months, and the doses of potassium iodide steadily increased until he took six drachms daily. At the end of the second month the optic nerve in the right eye began to show signs of simple white atrophy, and about one month later the same signs made their appearance in the left eye. Previous to this the field of vision began to be concentrically but somewhat irregularly narrowed, first in the right eye, afterwards in the left. In spite of all treatment, including regular and long-continued use of strychnia and the galvanic current, the optic nerve atrophy progressed slowly but surely, and, when last seen about two months ago, the patient could only distinguish fingers when held close before his face.

In this case also the process was a sclerosis, which probably began in the vicinity of the origin of the third and fourth cranial nerves on the right side, and extending slowly so as to involve one optic tract, if not the origins of both optic nerves. How long back the degeneration in the course of the optic nerve fibres began it is impossible to say, for the patient complained first of failing vision in one eye, then in the other, followed by narrowing of the fields of vision, before there was ophthalmoscopically any evidence of optic nerve trouble. The sclerosis was probably continuous in this case from behind forward, and not a multiple process. The degeneration of nerve fibres was descending at least in the optic nerves, and probably also in the oculo-motorius and patheticus. The lesion may have involved only one tract, and not have extended to the nucleus of origin of the other side, for the sclerosis, being progressive, would have extended down one tract to the optic chiasm, and thence involved both optic nerves. The field of vision in this case was somewhat different from

what is usually met with in cases of central lesion, for though the limitation was somewhat irregular, yet the tendency to concentric limitation was more marked than to sector-like defects. In this second case, as in the first one, the process of sclerosis had proceeded far enough to cause positive degeneration of nerve fibres, and hence the failure of the treatment to produce any improvement is explicable; while the steady diminution of vision is good evidence of the early extensive destruction produced by the lesion. This case also presented some unusual pathological features, if we accept the views of Fournier and Mauriac. These authors state that when the skin and periosteal lesions are severe, the subsequent lesions of the nervous system are usually slight. But this patient had suffered severely from lesions of the skin and periosteum, which did not, however, preserve him from disastrous consequences when his nervous system became involved.

CASE III. *Optic Neuritis ending in Atrophy of the Right Optic Nerve.*—The patient was a gentleman, æt. 48, of wiry constitution and nervous temperament, who contracted a chancre in June, 1877. The constitutional lesions had been severe, especially those of the mucous membranes, the faucial ulceration having been extensive. The patient was rheumatic and had suffered from chronic rheumatism for years. The chancre resisted treatment until a general roseola appeared, which was rapidly followed by a papular syphilide, and then the initial sore began to heal. During the summer the adenopathy was very marked, as well as the cutaneous lesions and the alopecia. Early in October he had an attack of cerebral trouble, ushered in by headache and some fever, which was probably a mild form of localized meningitis. Under large doses of potassium iodide he recovered from this attack, but his gait became unsteady and slow. On November 24, 1877, he suddenly lost the sight of the right eye, the amaurosis being complete for about fifteen minutes, and then the vision began slowly to return. When I first saw him, his vision was 15

$\frac{XL}{+}$ in both eyes with the myopia corrected, and ophthalmoscopically there was a small posterior staphyloma in each eye, with pigmentary atrophy of the choroid at the periphery. Between Nov. 24th and Dec. 17th, the patient had five similar attacks of total loss of vision, with gradual return of sight, but after each attack the vision never regained the standard held before the attack, and the duration of the stage of blindness was prolonged. On Dec. 17th the patient, who had previously been free from head-symptoms, had a violent attack of localized meningitis, with intense pain in the head, ending in wild delirium, and high fever. Vision was again at once lost completely in the right eye; and when, after four weeks of high fever and either wild delirium or a semicomatose condition, an opportunity could be obtained of testing his vision, it was found that he could only count fingers at one foot. The ophthalmoscope showed all the signs of "choked disk" in the stage of decline; the papillitis involving the entire head of the nerve, but most marked in the nasal half, several small hemorrhages upon the margin of the disk, the arteries very much reduced in calibre, and the surrounding retina œdematous and infiltrated. Under the combined use of mercury, large doses of potassium iodide, and hypodermic injections of strychnia, his vision slowly improved so that he could

distinguish the letters of Sn. XL at six inches; and under constant treatment it remained at this point for nearly two months. But in the end of March, 1878, the atrophy of the nerve and retina was very pronounced, and proved to be progressive as vision steadily failed. The arteries became mere threads, the veins were also very small, and the choroidal atrophy was much more extensive. In October a final examination showed absolutely no perception of light, a dirty gray atrophy of the disk, except on the temporal side where it was brilliantly white, and the pupil moderately dilated and almost immovable. There had, however, been no return of the head symptoms, there was then no symptom of constitutional syphilis, and the other eye had remained intact throughout.

This case is of considerable interest, as illustrating severe nerve lesions of central origin at an early period of constitutional syphilis. The chancre was contracted in June, and the first cerebral symptoms occurred a little more than four months later. The initial lesion resisted treatment obstinately, and did not begin to heal till a papular syphilide showed itself nearly two months later. The cutaneous and glandular lesions were severe, and hence we should have expected that the nerve lesions would be but slightly marked, instead of being of the most severe type. The transient and recurring attacks of blindness are of great interest. There was no plugging of artery or veins in this case, for the ophthalmoscopic signs were not those of embolism or thrombosis; nor would recovery of vision have occurred in either of the latter instances, except to a very slight degree. It is probable that the blood supply to the nerve and retina was interfered with by an exudation within the cavity of the skull at the base of the brain, and in the anterior fossa on the right side, in front of the optic chiasm; otherwise, the left optic nerve would also have shown symptoms of being interfered with. Whether the exudation pressed upon the ophthalmic artery, or directly upon the internal carotid, or had extended down beneath the sheath of the nerve, directly compressing the nerve fibres as well as the central artery of the retina, it is impossible to decide. It is certainly a rare occurrence to find a basilar meningitis so localized as to be confined to a limited region of one fossa of the skull, unless it be of traumatic origin. That the exudation occupied a limited space is certain, whatever may be said of the meningitis, for although the right optic nerve was affected, none of the motor nerves going to the right eye and its appendages were involved. The exciting cause of the meningitis it is not easy to determine, though it is probable that the severe headaches point to the development of a gumma of the dura mater somewhere in the anterior fossa on the right side, which, as it grew, excited an inflammation in the meninges immediately around it. These meningeal gummata sometimes grow with great rapidity, though in general the more rapidly they increase in size, the more likely are they to break down at the centre and undergo retrograde metamorphosis, especially if large doses of potassium iodide are administered.

CASE IV. *Ptosis of Left Side. Bilateral Optic Neuritis.*—The patient was a gentleman, aged 47, at the head of a large manufacturing business, who for years had had a great deal of care and had been closely confined to work. Eleven years before I saw him he had contracted a chancre, followed by very marked adenopathy, and extensive ulceration of the fauces, soft palate, and right wall of pharynx, the cicatrices being very broad and deep. The cutaneous lesions were never very marked and there has been but little alopecia, but he had suffered very severely from periostitis of the cranial bones, clavicle, and extremities, and has a number of very prominent and sensitive nodes upon the tibiae. For about five weeks before I saw him he had suffered from tremendous frontal headaches, not continuous, but coming on with increasing frequency. One week before he consulted me the left upper lid began to droop, and when I saw him in November, 1875, the ptosis was marked. I found the eyes normal, $V = \frac{15}{xv}$ in both, almost complete ptosis of the left upper lid, and an œde-

matous condition of both disks that was certainly suspicious. The headache was very violent and now almost constant. There was no fever and no increased temperature or acceleration of the pulse. The increasing pain in the head, the ptosis, and the somewhat rapidly appearing optic neuritis in both eyes led me to suspect periostitis at the base of the skull, anterior to the optic chiasm, or perhaps just beneath it, involving both optic nerves and part of the left motor-oculi nerves, rather than a basilar meningitis. There was no sign of any orbital trouble. The patient was at once ordered to bed, eight leeches were applied to the temples and behind the ears, a large hypodermic injection of morphia was given, and thirty-grain doses of potassium iodide three times daily were ordered to be begun at once. Relief from the pain was only gained by keeping the patient constantly under the influence of opium until the fourth day, when the iodide of potassium began to show its effects; and from this time the headaches were only intermittent and could be easily controlled by slightly increasing the dose. The ptosis however remained unaltered throughout the entire course of the treatment. The optic neuritis became very marked, with all the signs of choked disk, except that there were no hemorrhages, and finally ended in gray inflammatory atrophy, not complete, but confined to the temporal sides of the disks. The patient was under treatment for about four months, and, after all signs of inflammation in the optic papillæ had subsided, injections of strychnia were begun and continued daily for five weeks. Under this treatment the vision in both eyes improved somewhat, so that the patient could recognize Sn. CC at 12 feet eccentrically, and could read with some difficulty Sn. 12 with convex 10 spherical, but only a few words at a time, and then the nerve fibres seemed to fail in their conducting power.

In this case the diagnosis of the lesion rested between periostitis at the base and the rapid growth of a gumma upon the optic chiasm or just posterior to it, pressing upon both nerves and probably upon the left oculomotorius, though only a portion of the fibres of the latter nerve, going to the levator palpebræ, were interfered with. This gumma was in all probability a circumscribed tumour rather than a meningitis gummosa, because of the effects being confined to the optic nerves and a few fibres of the left third nerve. A meningitis gummosa is never as circumscribed as a true gummy tumour, and is apt to so thicken the dura and pia mater as to

compress several of the nerves running forward at the base of the skull near the median line. The absence of any elevation of temperature and of any marked acceleration of the pulse favour the view of a gummy tumour, while the severe pain and the optic neuritis might be due as well to periostitis. Meningitis seems to be excluded by the absence of febrile symptoms. The slight improvement in the vision produced by the hypodermic use of strychnia remained as long as the patient was under observation.

CASE V. Paralysis of Right Inferior Rectus; Right Ptosis; Deafness, complete on one side partial on the other; Atrophy of Right Optic Nerve.—The patient was a gentleman, æt. 52, and without any occupation, and was first seen by me in August, 1877. He had contracted the initial lesion of syphilis twenty years before, and this was followed during the first four years by severe constitutional lesions. Then there was an interval of several years during which the symptoms were very slight. Then he began to be troubled with what were probably affections of the peripheral nerves, and he suffered a great deal from neuralgia in various parts of the body. On several occasions he had attacks of diplopia and numbness of face and scalp, which were evidently due to intra-cranial disease of some kind, each attack being preceded by severe headache. These symptoms all subsided under proper anti-syphilitic treatment. About a year before I saw him he began to suffer from all the symptoms of Ménière's disease, which, however, subsided in about seven weeks. Six weeks before I saw him he was again attacked with vertigo, tinnitus aurium, and with a new symptom, that of failing vision in the right eye. When I saw him, an examination showed that the vertigo was probably due to a diplopia caused by paralysis of the right inferior rectus. There was also partial ptosis of the right upper lid. There was complete deafness in the left ear, and very marked loss of hearing in the right ear. The tuning-fork was not heard at all on the left side. The patient had, however, in both ears all the signs of chronic catarrhal otitis media, so that it was not a pure case of syphilis of the auditory nerves or labyrinths. He had noticed steadily increasing deafness in both ears, but more marked in the left ear, for about four years. His vision

was $\frac{15}{xxx}$ — in the right eye, and $\frac{15}{xx+}$ in the left eye. He could read

Sn. $3\frac{1}{2}$ at 22 inches, but his accommodation was completely paralyzed. The pupils were moderately dilated, but there was no paralysis of the sphincters for they contracted sluggishly under light. Ophthalmoscopically there was nothing abnormal except a slight haziness of the temporal portion of the right optic disk. There was no limitation of the field of vision and no subjective symptom of glaucoma. Under the prolonged use of the bichloride of mercury and iodide of potassium, some of the patient's symptoms improved. The accommodation became in great part restored, and the ptosis almost entirely disappeared. But the deafness remained unchanged in spite of the treatment usually adopted for catarrhal inflammation of the tympanic cavity, nor was there any improvement in the tinnitus. The vision in the right eye also failed steadily, and in about a month there appeared signs of atrophy in the outer portion of the disk, with an irregular defect in the corresponding part of the field of vision. Vision sank to $\frac{15}{c}$, and then slightly improved, possibly as the result of the

hypodermic injections of strychnia, though the potash treatment was continued all the time.

This case is one of considerable interest. There had evidently been transient paralyses of one or more of the ocular muscles at different times, accompanied by partial paralysis of the trifacial nerve, due to some intra-cranial lesion, which yielded to prompt treatment. The nature of these intra-cranial attacks it is difficult to determine. They were preceded by headache, and this, in connection with their sudden onset, would point to a periostitis or to the rapid formation of a gumma of the meninges. Then at a subsequent period came on the group of symptoms known generally under the head of Ménière's disease, which in this particular case are difficult of location. It is known that affections in the sound-conducting apparatus can, under certain circumstances, produce transitory disturbances of the equilibrium without justifying us in assuming organic changes in the labyrinth; and that in affections of the middle ear, attacks of vertigo may be associated with deafness when the morbid process has invaded the labyrinth. A recent writer lays great stress upon cold and upon catarrh of the middle ear, in the causation of Ménière's disease, and says that most of the cases of this disease are of a secondary nature, and are due to inflammatory processes in the tympanum or mastoid antrum. Another writer thinks that only those cases should be considered under the name of Ménière's disease in which the auditory nerve is affected centrally, or in its course, or in its peripheral expansion. This neuropathic form of the disease is so sudden in its onset as to receive from Gottstein the name of apoplectiform. In the case under consideration, the element of difficulty lies in the existence of a chronic catarrhal otitis media of several years' duration. Any exacerbation of symptoms of the tympanic trouble might produce transitory disturbances of the equilibrium, which would disappear in time without treatment. Or the attack here might have been a true neuropathic onset of Ménière's disease, which yielded to anti-syphilitic treatment. The second attack of this Ménière's complex of symptoms was accompanied by failing vision and paralysis of one of the ocular muscles, and this might have given rise to the vertigo. But in view of the optic nerve degeneration, I am inclined to think that there was an intra-cranial lesion at the bottom of the last attack, which involved at least some of the fibres of the motor oculi as well as the optic nerve on the right side. The left auditory nerve was fatally involved at some portion of its course, or more likely at its origin, for the deafness on the left side was absolute. This would seem to contradict the conclusions of a recent investigator, that there is a communicating branch between the two auditory nerves. The pathological process seems to have been a sclerosis, rather than a gumma, but any attempt to locate the lesion with precision is so beset with difficulties, that the conclusion would scarcely be more than conjectural.

ARTICLE IX.

A CLINICAL CONTRIBUTION TO THE STUDY OF THE FEVERS OF THE MISSISSIPPI VALLEY. By RICHARD B. MAURY, M.D., of Memphis, Tennessee. (Read before the Tri-State Medical Society of Tennessee, Arkansas, and Mississippi.)

By way of introduction to the subject which I propose to discuss in this paper, the attention of the reader is invited to the following description of bilious remittent fever, taken from Wood's *Practice of Medicine*.

"Remittent or bilious fever occurs more or less in almost all parts of the United States, lying between the Northern Lakes and the Gulf of Mexico. . . . The situations in which the disease is most prevalent, are the valleys of streams, the borders of lakes or ponds, the neighbourhood of marshes, and the rich prairies of our Western States. . . . It is, in general, a much more serious disease in the southern and southwestern sections of the United States, than in those portions of the North which are still within the limits of its prevalence. But the disease is not confined to this country; it is endemic almost everywhere in hot climates, and especially where heat, moisture, and decaying vegetable matter act conjointly. . . . It is the disease of whose ravages in the East Indies, Africa, the Mediterranean, and South America, we have heard so much; which has depopulated the Campagna of Rome, and rendered intertropical Africa uninhabitable by whites."

Further quoting and condensing from the same source, we learn that this fever is usually ushered in by a chill. Its characteristic features are headache, backache, and great restlessness; nausea and vomiting of bile; thick, white or yellow coating on the tongue; epigastric tenderness; a yellowish hue of skin and conjunctiva; constipation, and scanty, high-coloured urine. These symptoms are not all present in every case, but they are all so often to be met with that they could not be omitted in an account of the disease.

The first paroxysm of fever is generally followed by a marked remission after twelve or eighteen hours, and each day there may be a distinct remission, or the fever may assume a comparatively continuous form from the start.

If the disease retain a distinct paroxysmal character, it generally runs on, when not interrupted, for two or three weeks or more, terminating at last in a spontaneous solution at the end of one of the paroxysms, or in a regular intermittent, or in a kind of low typhoid affection.

If it approach the continued form, it generally advances to some point of time between the seventh and fifteenth days, when it either declines or ends fatally, or takes on a new character.

When it is to terminate favourably, it either declines slowly from the culminating point, or ends abruptly by profuse sweating, diarrhœa, or diuresis, or changes into the intermittent form.

In not a few cases, instead of following one of the courses above indicated, it takes on, about the ninth or twelfth day, a character resembling enteric fever. Then all regularity in the recurrence of the paroxysms

ceases, and a typhoid state ensues. Under these circumstances, the fever runs on for three or four weeks or more.

The average duration of bilious fever in all its forms may be stated at about fourteen or fifteen days. It sometimes ends as early as the fifth or seventh, or about the ninth or eleventh; and is sometimes greatly protracted, even to four weeks or more.

The description given by Flint in his work on "Practice" agrees, in all important particulars, with that which has just been quoted from Wood; and neither of these authors differs materially from Dr. Drake, as he has expressed himself on this subject in "The Diseases of the Interior Valley." After residence, as a physician, for twenty years in the Mississippi Valley, with the amplest opportunities for studying this subject, I can say most positively, that such a disease as that depicted by the eminent authors just quoted, has never fallen under my eye.

Making allowance for the protean forms in which malarial fevers appear, I cannot find in this description a faithful portraiture of bilious remittent. If such a description were true, there could be no rational indications for prognosis or treatment; and it would be impossible to have a clear idea of the course or duration of the disease in any given case.

The field of my observation has been a very varied one—along the river bottoms and in the hills, in civil practice and in military service, from the southern portion of Mississippi to the northern, in West Tennessee and in Southern Alabama—regions in which malarial diseases appear in every possible form, and where the poison manifests its influences in every degree of intensity.

Dr. Wood's description is, I believe, in reality a description of two entirely distinct forms of disease. One of these forms of fever is of short duration, and may, with perfect propriety, be styled bilious remittent, or malarial remittent. In its course and duration it is as well defined, and as distinctly limited, as acute pneumonia or any other fever with which we are acquainted.

The second of these forms of fever is one which may, with equal propriety, be called malarial continued. It also runs a definite course, which, like typhoid, may be divided into stadia. It is self-limited, and cannot be jugulated or shortened by any known means.

Speaking from my own observation, and after conference with very many of my professional brethren in various localities, the malarial fevers which prevail throughout the southern portions of this valley may be classified as—

- I. Malarial Intermittent.
- II. Malarial Remittent.
- III. Malarial Continued.

Since it is quite as impossible to study fevers without a chart of their thermometric range, as it is to compare different routes for the building of

a railroad without having before us a profile outline of the surfaces upon which it is to be laid, I shall illustrate the subject to be presented by carefully prepared charts of temperature.

Passing by the discussion of intermittent fever, I proceed at once to the study of

Malarial Remittent.—This is a fever of abrupt invasion, introduced usually by chill, severe headache, and backache. Nausea and bilious vomiting, pain through right hypochondrium, constipation, and scanty urine without albumen, are usually present. Remission occurs in twelve, twenty-four, or forty-eight hours, to be followed soon after by an exacerbation. In early summer, with appropriate treatment, this fever often terminates on the third day; as a rule, it subsides on the fifth day. In the fall, it is occasionally prolonged until the seventh, and in a very few instances I have seen it prolonged to the ninth day. Even without medical treatment, it shows a marked tendency to defervesce on the fifth day, and will often do so completely without the aid of quinia, under the influence of rest, liquid diet, and the cold-water treatment.

Practically, malarial remittent is a fever of five days' duration, and we may, as a rule, confidently predict its termination by that time, under judicious management, in an otherwise healthy subject.

Left entirely to itself, without care or medicine, this fever would probably assume a continued form, the secretions becoming greatly disordered, and the internal organs, chylipoietic viscera especially, being congested, and perhaps inflamed. Upon this point, however, I have no certain information, for the physician, on seeing for the first time a patient who had been long sick, would be perplexed to decide whether the case originally was one of malarial remittent or malarial continued. It would, indeed, be almost impossible to arrive at any conclusion.

CASE I. Quotidian Remittent. (Chart 1.)—J. R. E., æt. 21 years. Twenty grains of quinia given during each remission, beginning with the first. Defervescence on third day. Exacerbations occurred at 5 A. M. on first day, at 1 P. M. on second and third days.

At 6 P. M. on fourth and fifth days, there was so severe an attack of intercostal neuralgia, under the right breast, with inability to breathe in the recumbent position, as to necessitate hypodermic morphia. No elevation of temperature accompanied the neuralgic paroxysms. Quinia was given again on the fifth day.

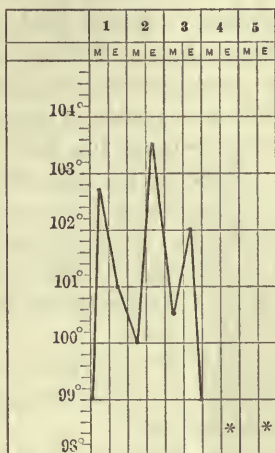
CASE II. Quotidian Remittent. (Chart 2.)—J. R. E., the same patient referred to in Case I. Taken sick three weeks after first attack. On fifth day, the temperature rose higher than on any previous day of his illness, though quinia to the extent of 20 grains was given during each remission, beginning with the first.

Defervescence occurred on fifth day. Exacerbations occurred at 4 A. M. on the first, 6 A. M. on the second and third, and 9 A. M. on the fourth and fifth days.

CASE III. Quotidian Remittent. (Chart 3.)—F. D., a girl, æt. fourteen years. Quinia was given at the height of the second exacerbation,

ten grains at 9, ten grains at 10, and ten grains at 11 A. M., *i. e.*, thirty grains in two hours. Again between midnight and daylight twenty grains. It was repeated to the extent of twenty grains during third and fourth remissions. The fifth exacerbation occurred as usual, and no quinia was given, but, notwithstanding, complete defervescence occurred abruptly.

Chart 1.



* Neuralgia on 4th. & 5th. days.

Chart 2.

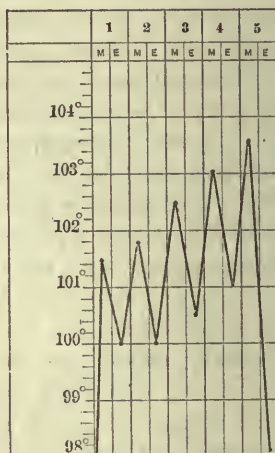


Chart 3.

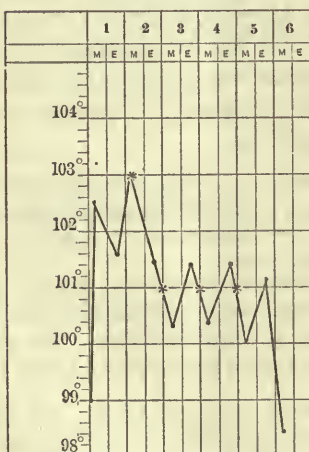
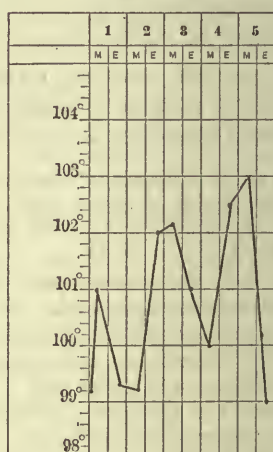


Chart 4.



CASE IV. *Double Tertian Remittent*. (Chart 4.)—E. P., æt. 16 years. First paroxysm at 7 A. M. Exacerbation at 2 P. M. on second day. Repeated on third day at 8 A. M.; on fourth day at 2 P. M.; on fifth day at 9 A. M., after which defervescence was complete. Quinia twenty-four grains was given during each remission.

CASE V. *Pernicious Remittent*. (Chart 5.)—H. M., male, æt. 11 years. Attacked 10th June. Invasion between midnight and daylight.

First visit was paid at 5 P. M. of that day. He was attacked very violently with fever, headache, backache, extreme restlessness, and uncontrollable vomiting, at first of bile and afterwards watery mucus. Irritability of stomach continued until subsidence of the fever on the fifth day, to such an extent, that even the smallest quantity of milk with lime-water was rejected. No perceptible remission occurred until the third day. Defervescence was sudden and complete on fifth day. No quinia was given, and no medicine of any kind, except three grains of calomel, which were administered before I saw him. This acted upon the bowels several times. The cold water treatment was vigorously and unremittingly used, by means of sponging the surface with iced whiskey, and compresses wrung out of ice-water, covering the front and back of the trunk. During this attack the pulse ranged from 120 to 150. Delirium was constant. Convalescence was rapid.

Chart 5.

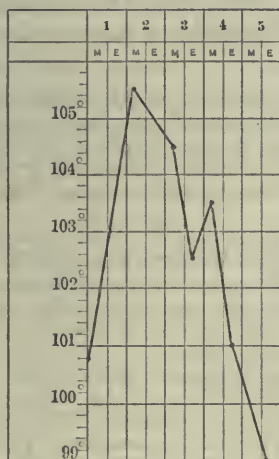
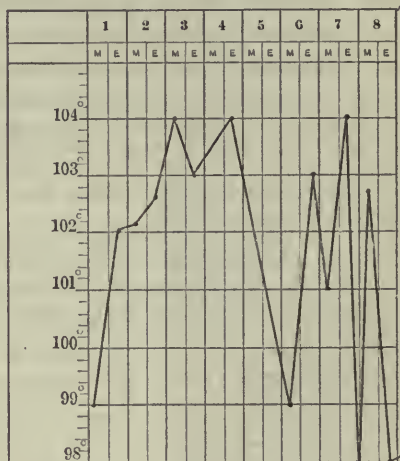


Chart 6.



CASE VI. *Quotidian Remittent of eight days' Duration.* (Chart 6.) —B. H., æt. 2 years, a delicate nervous girl. Nausea and great restlessness marked the invasion. Quinia eight grains was given at 12 M. on third day. This was in part rejected. Quinia sixteen grains was given by enema at 11 P. M. on the fourth, but was in part rejected. It was repeated with same result, on the fifth night. Soon afterwards, nine grains were given by the mouth and retained. At 11 P. M. on the sixth ten grains of quinia were given by mouth. The cold water treatment was used as in the last case.

Two features in this case should be noted: First, the complete intermission which occurred at the close of the fifth day, though quinia had been given so unsatisfactorily and ineffectively. Second, the abrupt termination of the fever at the close of the eighth day, the thermometer sinking at midnight to 96°, and the pulse falling to 80, being very feeble and irregular, and requiring the administration of brandy and broth, and the rubbing of the body with dry mustard. No medicine of any kind had been administered since 11 P. M. on sixth day.

These cases have been selected from my records, as illustrating the natural tendency of this fever, when aided by appropriate treatment, to terminate by crisis on the fifth day. I might multiply them without number, if it were necessary.

Such was the rule with the fevers of lower Mississippi. Such has been the rule with those of West Tennessee. Very rarely have I found them running to the seventh and ninth days. This fever affords a complete illustration of the ancient doctrine in regard to critical days. After having observed these features of remittent fever in Mississippi, I met with Cleghorn's little book on the "Epidemical Diseases of Minorca," as observed by him from 1744 to 1749, edited by Dr. Benjamin Rush, of Philadelphia, in 1809.

Dr. Elisha Bartlett, in his work on the "Fevers of the United States," edited by Alonzo Clark, M.D., quotes very freely from Cleghorn, and says of him that "he seems to have studied this subject with great care."

Cleghorn says of the fevers of Minorca—

"Those fevers which come to their height in the third period, terminate in the fourth or fifth period; those which come to their height in the fourth period, terminate in the fifth or sixth; those which come to their height in the fifth, terminate in the sixth or seventh. If the fever increases to the seventh, it probably will not cease before the ninth; but it rarely happens that remitting tertians run out to so great a length.

"But it is much more common to meet with tertians which set out furiously, with severe subintrant double paroxysms, so that for some days, they have little or no interval. On the third or fifth day, a profuse sweat commonly brings on an intermission, and afterwards the disease assumes the type of a double intermitting tertian or semi-tertian. Such fevers I have frequently observed to terminate spontaneously on seventh, ninth, and eleventh days.

"If the paroxysm on the fifth day be evidently the longest and most severe that has happened . . . I have recourse to the bark . . . and the assistants are strictly enjoined to comply punctually with these directions, lest if this interval escape, we should not afterward have a favourable opportunity. Yet it is not always in our power to put an immediate stop to the fever by this means. On the contrary, do what we can, it will often proceed in its career, and, in spite of all our attempts, run obstinately on to the seventh or ninth day."

These are the observations of a careful and accurate observer, made before the days of quinia and cold-water treatment, when the physician's main reliance was in the use of evacuant medicines, and bark tardily administered.

Prof. W. C. McLean of the Army Medical School at Netley, who wrote the article on Remittent Fever for Reynolds's "System of Medicine," after an extensive experience in India, says—

"As soon as the second remission appears, quinine must be given as before, and continued until full saturation of the system is evidenced by cinchonism. So soon as this state is brought about, in a vast majority of instances, the exacerbations will become milder and terminate in a copious sweat, and the patient will enter on a state of convalescence."

Leaving us to infer that defervescence will occur in a few days, he further adds, that this fever has a duration of from five to fourteen days, and that

like all forms of miasmatic fevers its duration is much affected by treatment, and the action of antiperiodic remedies. Dr. McLean clearly indicates in his article, that this is a fever of short duration, and one which he expects to terminate, in all its forms, quite speedily by the vigorous use of antiperiodics, no matter at what period in its course he is called to see it.

Dr. Aitken ("Science and Practice of Medicine"), whose material is also gathered from Indian observations, states that—

"when the disease does not terminate fatally, amendment is generally observed after the fifth exacerbation, which may subside in very copious perspiration." And again, while discussing treatment, "by these measures the daily decline of the disease is seen, and consequently there is a daily diminishing occasion for the use of active measures of cure, till towards the fifth, sixth, or ninth day, convalescence is established."

In view of the observations here presented, it would then seem eminently proper, in defining bilious remittent fever, to say that it is a disease having a natural tendency to defervescence on or about the fifth day; that with proper treatment it can sometimes be terminated on the third day, nearly always on the fifth day, and only in exceptional cases will it last until the seventh or ninth day.

The great importance of recognizing such a definition clinically is, that the physician may have a definite aim in treatment, which I submit he can scarcely have if the description quoted from Dr. Wood is correct.

I now approach the study of another and entirely distinct form of fever, due likewise, in all probability, to the influence of the malarial poison, whatever that may be. This has been called—

Malarial Continued.—All the writers with whom I am acquainted seem to regard this fever as a form of bilious remittent. Thus Dr. Elisha Bartlett says—

"In the warmer malarious regions, and during the prevalence of the graver forms of periodical fever, the bilious remittent variety, especially, frequently loses to a great extent its periodical or remittent character, and assumes more or less entirely a continued form."

Cases of this kind are by others referred to as "neglected remittents," and as "remittents with adynamic tendencies;" and for several years past, as far as I can learn, this is the form of fever denominated in the mortality reports of this city "typho-malarial."

Its invasion, instead of being abrupt, as is the case with remittent, is sometimes marked by prodromes. In many cases, the patient has been ailing for a week before going to bed. In other instances he will have had a repetition of chills for two or more weeks, at irregular intervals, when finally the fever which follows the chill assumes a continued form, and goes on rising gradually, day by day, until on the sixth or seventh day, when the temperature has reached $103\frac{1}{2}^{\circ}$ or 104° . In other cases there are no premonitory symptoms. The patient is attacked in the

midst of apparent health, without appreciable cause, having had no previous manifestation of malaria.

This fever presents a stadium of increase of about one week, a stadium of height of five or six days, and a stadium of decrease, which terminates completely on the twenty-first day.

Its thermometric range is decidedly lower than that of typhoid. It seldom goes above $103\frac{1}{2}^{\circ}$. Vomiting of bile is quite a common symptom during the first days of the attack. Bronchial catarrh is generally present. Constipation and a concave abdomen are marked features.

Appreciable splenic tenderness or enlargement has been so rare in my observation, that from memory I can recall but two cases in fifteen years.

All the essential features of typhoid or enteric fever are absent. There is no diarrhœa, no ileo-cæcal tenderness or gurgling, no meteorism, no eruption of rose-coloured spots. As a rule, there is entire absence of abdominal symptoms.

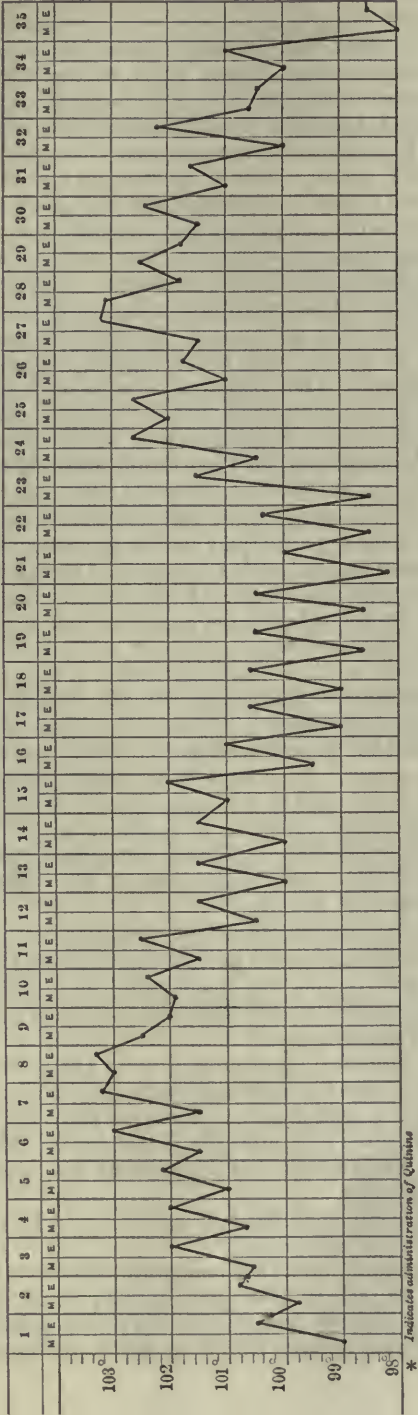
In some instances where the patient's previous condition was bad, perhaps the system undermined by malaria, and where he was unfavourably situated for treatment, or had had no treatment, I have seen diarrhœa, dry, red, and shining tongue, sordes and low delirium with picking at the bedclothes, and a condition closely resembling typhoid.

There were a few such cases among the soldiers of the 28th Miss. Reg't Cavalry, encamped in the Mississippi bottom in the summer of 1862. Their health had been shattered by repeated attacks of intermittent and remittent fevers; and they were located where there were lacking all the essentials for the proper treatment of continued fever, but where there was no suspicion of the existence of the poison of genuine typhoid.

In quite a large proportion of the cases of this fever, a prominent feature is neuralgia. It will come on about mid-day, and continue until after midnight; and in some instances so severely, as to demand the hypodermic use of morphia. In one case, the pain will be supra-orbital, and extend to the side of the face, neck, and shoulder. In another, the neuralgia attacks the intercostal nerves of one or both sides so severely, that there is dyspnœa from inability to expand the chest. In a third, I have seen this pain localized in the right side, over the region of the ascending colon, extending therefrom upwards into the chest and downwards to the hip. In a fourth, it is in the abdomen. These neuralgias are periodical, coming on in the forenoon, increasing in severity during the afternoon, and disappearing about midnight. They constitute a very troublesome and distressing feature in many of the cases of malarial continued. The following records will serve to illustrate the fever under discussion.

CASE VII. *Malarial Continued Fever.* (Chart 7.)—Mrs. —, æt. 35 years, a delicate lady, after suffering from prodromata went to bed with fever on 12th of May. That night, between midnight and daylight, twenty-eight grains of quinia were given; and the second night, at the same hours

Chart 7.



* Indication administration of Quinine

twenty-four grains. The bowels were moved by castor oil. As the quinia did not check the progress of the fever, but disordered the stomach, which was already weak and irritable, it was not again repeated. Attention was given to securing proper action of the skin and kidneys, by sponging the surface regularly and systematically with whiskey at a temperature varying according to the bodily temperature. If this did not go above $101\frac{1}{2}^{\circ}$, whiskey alone was used; if it reached or rose above 102° , whiskey with ice in sufficient quantity to reduce it. As to food, buttermilk was used almost exclusively, and was given every three hours. Two or three times a day, chicken-water or beef essence was substituted. No stimulants were given, because not believed to be required. The bowels were constipated, the abdomen concave. There was no ileo-cæcal tenderness or gurgling. Enemata of warm water were used every few days, to move the bowels. The secretion of the kidneys was very scant, only about six ounces in twenty-four hours a great portion of the time. It contained no sediment. No albumen was at any time found. The patient's capacity for food and drink was exceedingly small. As the fever rose in the evening, gastric uneasiness with nausea increased; and after 10 P. M., it was impossible to feed her at all, until daylight came again.

About the 16th day, as the fever lowered a little, her willingness to take food increased. Up to this date, she had taken it under protest. By the 21st day she had some appetite, and her temperature fell to 98° on this day. In her eagerness to replenish her shattered strength, she, on the 22d, imprudently ate of solid food, and in large quantity for her. She began to suffer after this from headache and anorexia, and next day the temperature rose, going higher and higher until the 27th day. From this, there was a gradual decline until the 35th day, when it again became natural. After the administration of quinia on first and second days of the fever, no medication was attempted. Towards the close of the attack, the bowels were allowed to go unmoved for six days, because no discomfort was occasioned by them. They were then moved by enema.

A glance at the fever chart in this case shows that there were really two fevers, one of twenty-one, another of fourteen days. The second was clearly a relapse occasioned by imprudent eating, and this, I am sure from multiplied observations, is the explanation of the continuance of many of these cases beyond the 21st day.

The maximum pulse beat in this case was 98; the minimum 84 per minute. Observations of temperature were taken every two hours during the attack.

No attempt to give quinia was made after the second day, because it acted as a disturbing element, and from previous observations I was satisfied it would accomplish no good.

CASE VIII. *Malarial Continued Fever.* (Chart 8.)—H. P., æt. 5 years, had been absent from Memphis all summer in a healthy country. Returned in unusually good health. Was attacked with fever on evening of Nov. 27th, about three days after his return home. He was seen by me at midnight; had had no chill, but temperature was then 100° . A dose of castor oil was ordered.

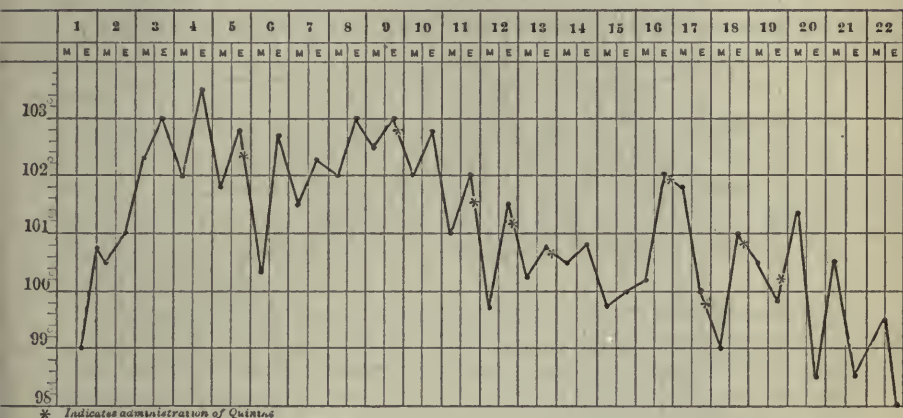
2d day. Gave several small doses of calomel and Dover's powder, and tr. aconit. gtt. ij, every two hours.

3d day. Much cough, pulse 150, temperature 103° . Discontinued the aconite and gave tr. verat. virid. gtt. iij, with squill every two hours. This nauseated and sweated him, but did not reduce pulse or temperature.

4th day. In morning ordered oil silk jacket to the chest, because cough

was troublesome, and pulmonary inflammation was feared. The temperature reached $103\frac{1}{2}^{\circ}$ early in the afternoon, the jacket was in consequence removed, and sponging with iced whiskey used instead. This sponging was made use of on the fifth, sixth, seventh, and eighth days every hour or two, whenever the temperature rose above 102° . But for this treatment it was evident that the thermometer would have gone higher than indicated by the chart.

Chart 8.



On 5th day, at 8 P. M. ten grs. quinia and four drops of liquid Dover's powder were given in one dose. This was repeated at same hour daily, from the ninth to the nineteenth day. During this fever, every function was to all appearance well performed.

The bowels acted spontaneously most of the time. Oil was required twice; occasionally an enema. The kidneys acted freely and regularly, and the urine appeared natural and was free from albumen. The tongue was soft and moist with a light white fur. Bronchial irritation was troublesome, but repeated examination proved the absence of pulmonary inflammation. The cough was harassing in proportion as the temperature rose, and was always lessened by the application of iced compresses to the chest and abdomen.

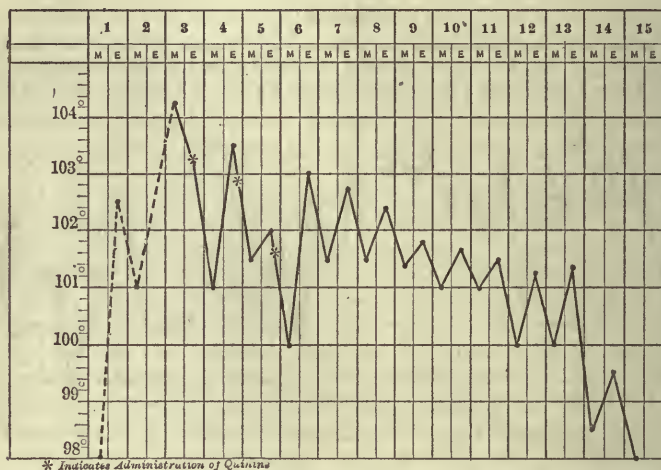
Diet was exclusively milk and lime-water, given every two hours during the day, and three hours at night. Sponging was used hourly when the temperature was above 102° .

There were no abdominal or brain symptoms and no eruption. There was no indication of a local lesion.

CASE IX. *Malarial Continued Fever.* (Chart 9.)—H. H., an active man, æt. 30 years. Had not felt well for several weeks; was taken with fever on evening of 25th November; had fever all next day and night, and came to my office in forenoon of 27th November, where I found his temperature $104\frac{1}{2}^{\circ}$ —probably raised by exercise, as he had been attending to business for several hours before. Between noon and midnight he took thirty-two grains of quinia, and on morning of 28th of November his temperature was 101° . At 6 P. M. it rose to $103\frac{1}{2}^{\circ}$. At midnight he took twenty-four grains of quinia, which was repeated next night at same hour.

As he suffered greatly from muscular pains in cervical spinal region and in the arms and chest, so that it was painful to take a satisfactory inspiration, ten grains of quinia daily were given about 8 A. M. for several days, and with marked relief. These pains, which were regarded as spinal symptoms, increased with the rise of fever in the afternoon. No calomel was given. Castor oil was used at first, and on two subsequent occasions the

Chart 9.



bowels were moved with citrate of magnesia. His diet was milk or buttermilk. Urine nearly normal; no albumen. Complete defervescence occurred on fourteenth day, when the temperature was $98\frac{1}{2}^{\circ}$ in morning and $99\frac{1}{2}^{\circ}$ in evening. The pulse ranged from 74 to 96. The cold-water treatment was systematically used.

Remarks.—I am well satisfied that this fever is not the result of neglected remittents, as some have intimated. It begins, continues, and ends as a continued fever. Its duration is in no way affected by the exhibition of antiperiodic remedies.

The “status typhosus” is not one of its characteristics; when it occurs, it is exceptional, and is due to the operation of causes extraneous. The abdominal symptoms are absent, hence there would seem to be no relationship to typhoid.

While typhus is purely contagious, and typhoid is a miasmatic contagious disease (Liebermeister), this fever is neither, but has a different etiology.

I must here refer to two cases of this fever in which grave cerebro-spinal symptoms supervened upon crisis, a circumstance which has been noted in the other forms of continued fever.

In one of these, a boy of 12 years, whose attack had been of very moderate severity, complete defervescence occurred on the 21st day. On the evening of the 22d day, there was a convulsion followed by stupor. The next day another convulsion, with hemiplegia. Stupor continued, and death occurred on the 5th day.

The second case was that of a boy of 14 years. Fever left him on 21st day. At night there supervened paralysis of the left arm and leg, but the cerebral functions were not disturbed. In a few weeks these symptoms disappeared, and convalescence progressed favourably; but within a year true epilepsy appeared, and has continued to the present time, after the lapse of ten years.

The supervention of cerebro-spinal lesions as immediate consequences of crisis in typhus and typhoid fevers, is discussed by Hudson in his work on "Fevers."

I regret that, in the fatal cases of malarial continued fever which have occurred in my practice, it has been impossible to obtain an autopsy. A better knowledge of its pathology is much to be desired.

Though familiar with typhoid fever from my service in the wards of Bellevue Hospital, under the guidance and teaching of Drs. Clark, Metcalfe, and McCready, I have never recognized it in this valley until the past summer; and this observation is in accordance with the oft-expressed views of medical acquaintances, if I except an occasional case clearly due to importation.

In June last, a boy of 6 years was under my care for what I considered typhoid fever. He recovered, the fever having lasted twenty-nine days.

A second case occurred soon after, having no connection with the first. This patient, a young woman 26 years of age, had lived some years in Hickman, Ky., and having chills there, had acquired a large spleen. She was in good health when attacked in Memphis, where she had been living for more than a year. She had fever eighty-one days, and died on the ninety-second day of her illness. The case was carefully studied, and records of temperature and pulse kept throughout. The features most prominent in her history were fever, bronchitis, greatly enlarged, very tender, painful and hard spleen, diarrhoea, and swollen belly. There was no eruption, no intestinal hemorrhage. Death from exhaustion.

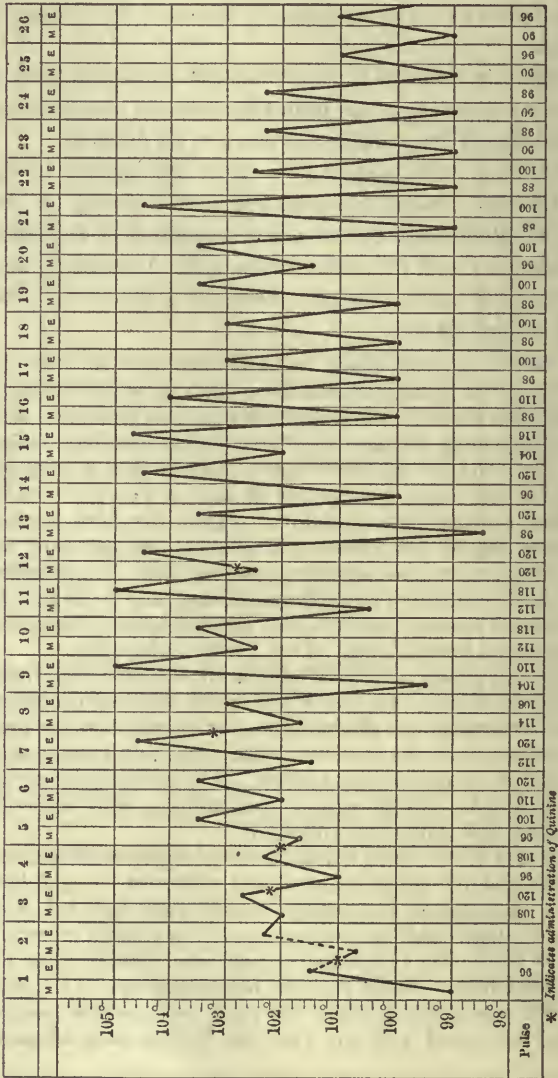
At the autopsy, round and oval-shaped ulcerations were found in lower part of small intestine. In two of these the healing process was clearly established, for around the circumference of these ulcers the mucous membrane was adherent to the muscular coat. A third ulcer was situated on the upper end of an oval Peyer's patch. The peritoneal coat of the ileum was much injected. There was no peritonitis. The mesenteric glands were decidedly and uniformly enlarged.

The liver was denser than normal; was of a yellow colour, rather larger than natural, had no abscesses, and was adherent by old lymph to the diaphragm. The spleen was enlarged, hard, very dark red, with no purulent deposits. Gall-bladder contained seventeen small calculi, which had given rise to no known symptoms during life. There were evidences of old pelvic peritonitis. Kidneys were not examined. Dr. Albert Sessel, of New York, saw and examined the piece of intestine removed at the autopsy, and concurred with me that the lesions were those of typhoid fever.

This case established the fact that typhoid fever existed here. Other cases soon appeared, and one of these is presented to show how regularly typhoid may pursue its course, undisturbed though surrounded by malaria.

CASE X. *Typhoid Fever*. (Chart 10.)—Miss —, æt. 29 years, a resident of Paducah, went to bed on the 22d September. She had spent the month of July at Gibson's Wells, in West Tennessee, and came from there to Memphis on 15th August. The records of temperature were taken every two hours, night and day; of respiration and pulse night and morning. The accompanying chart records the maximum and minimum

Chart 10.



temperature daily, and not simply morning and evening temperatures. The fall of temperature on ninth day was probably due to action of calomel given the night before and that morning, in doses of six grains, aided by the

influence of quinia given, in a single dose of twenty-four grains, on the night of the seventh day.

The great fall of temperature on the thirteenth day seemed due to salicylate of soda, fifteen grains every two hours during the day, from 10 A. M. to 10 P. M. ; in all one hundred and five grains.

During the entire course of the disease, the temperature day and night was controlled by sponging with ice-water, or the application of cold compresses, whenever the thermometer reached 102° or over. There were present mental weakness and dulness, deafness, and quiet delirium, and during the first week, severe headache ; moderate but marked and persistent diarrhoea, with involuntary discharges from the bowels ; tympanites, gurgling, and great tenderness on pressure over the ileo-cæcal region.

The urine in the beginning was scant and high-coloured, but increased under the free use of Apollinaris water. During the second week the use of the catheter was necessary. At the close of the second week the urine was albuminous, with a specific gravity of 1020. Under the microscope, there were numerous renal cells, the nucleus in some distinct, but in others not visible, the cells being filled with yellow granular matter. There were also cylindrical masses of granular matter. No tube casts. After twenty-first day, for two weeks, there was deposit of urates on standing. Although, as indicated by the chart, this fever ran its course practically by the twenty-eighth day, and convalescence was entered upon, the temperature was daily above the normal, until November 1st, when the patient was allowed to sit up for the first time.

Typho-malarial Fever.—Of late years the term typho-malarial has quite frequently appeared in our mortality reports, but I think for the most part without scientific propriety.

This term has been applied generally, by our physicians, to all the cases of continued fever, because they were recognized as not being typhoid, and were not looked upon as remittents. There was, indeed, no other name in the current medical nomenclature to apply to them, with any semblance of propriety. These cases I have always designated as malarial continued. As regards the term *typho-malarial*, I see no objection to its use, provided it is applied as its originator proposed.

From communications in the journals, it would appear that much confusion exists in the mind of writers, as to the correct meaning of this term. By many it is used to designate a fever which they regard as malarial, but in which the patient has lapsed into a typhoid state—the so-called remittents with adynamic tendencies—though there exist none of the abdominal features of enteric fever.

Some perhaps regard this term as applicable to a special type of fever. Others of my acquaintance are quite at a loss as to the meaning of the term, and doubt its applicability to any form of fever.

At the meeting of the International Medical Congress, in Philadelphia, in 1876, Dr. J. J. Woodward presented a paper entitled “Typho-malarial Fever : is it a special type of fever?” He declared that the term typho-malarial was proposed, not to represent a specific type of fever, but “to

designate all the many-faced brood of hybrid forms resulting from the combined influences of the causes of malarial fever and enteric fever."

The Section on Medicine adopted this conclusion: "Typho-malarial fever is not a special or distinct type of disease, but the term may conveniently be applied to the compound forms of fever, which result from the combined influence of the causes of the malarial fevers, and of typhoid fever."

Having this for our authority, it may be declared that, before applying the term typho-malarial to any given case of fever, we must have satisfactory evidence of the operation of two causes, one which gives rise to malarial fevers, the other which produces typhoid or enteric fever.

Inasmuch as we do not look for specific pathological lesions in malarial fevers, our main reliance in the diagnosis of them must be in their thermometric range, and the study of this range has been one of the chief objects of the present paper.

All the world agrees that there is no reliable evidence of the operation of the typhoid poison, except inflammation, with enlargement and ulceration of the solitary and agminated glands of the small intestine, and enlargement of the mesenteric glands. The full requirements, therefore, for a diagnosis of typho-malarial fever are a thermometric range presenting the combined peculiarities of the malarial fevers and of typhoid fever, together with the gastric and hepatic symptoms of the former, and the intestinal lesions of the latter.

I have read Dr. Woodward's paper with profound respect, and I admire the fairness and the scientific accuracy which he has displayed in the discussion of this interesting subject. In this paper before the International Congress, he declares that the fevers observed in the Federal Army, to which he proposed to apply the term typho-malarial, were divisible into two groups. In the first group the type resembled very closely ordinary typhoid fever. The cases began, continued, and ended like typhoid, and at death presented the characteristic lesions of the patches of Peyer. But in many respects they were unlike typhoid. The thermometric range was different. The daily evening exacerbations observed in typhoid were exaggerated, and often assumed a tertian or double tertian type.

In the beginning of the attack it was common to find the gastric and hepatic disturbances so characteristic of remittent fever; and in convalescence the ordinary ague paroxysms often appeared. In the second group—

"in which the malarial phenomena predominated, the disease began as a simple intermittent or remittent fever of quotidian, tertian, or quartan type, the most frequent form being a simple or double tertian; but after a week or ten days, the fever assumed a more or less completely continued type, with many of the phenomena characteristic of typhoid fever, such as diarrhœa, abdominal tenderness, meteorism; muttering delirium, dry, brown tongue, and the like. But even when the typhoid phenomena were most pronounced, some of the most characteristic of them were often wanting. Thus sometimes there was no diar-

rhœa at all but constipation instead. The rose-coloured eruption was generally entirely absent; gastric disturbance, hepatic tenderness, and an icteroid hue of countenance were more generally present than in simple typhoid fever.'

The pathological lesions to which we must now look for deciding the true nature of the cases constituting this group, will be conveniently classed under two heads.

Dr. Woodward says—

"I have collected a number of autopsies of cases of this kind, in which diarrhœa had been present during the fever, and in which after it had assumed a continuous type, it had strikingly resembled typhoid fever, but in which dissection showed no other lesion in the alimentary canal than a smart intestinal catarrh."

These cases do not come up to the requirements laid down by us, and I would say therefore were clearly not typho-malarial, for there is no evidence whatever of the operation of the typhoid poison in them. They were, to my mind, probably cases of malarial fever of the continued form, in which the patient lapsed into a typhoid condition, as he might have done in erysipelas, dysentery, puerperal peritonitis, or other disease.

But mark well, the lesions found in most of the cases of this group were—

"patches of inflammation scattered irregularly throughout both small and large intestines, and enlargement of the closed glands. The solitary glands of the small intestine appeared as projecting tumours the size of pin-heads, which often had constricted necks so that they resembled tiny polypi. The agminated glands of Peyer, slightly prominent, were often the seat of pigment deposit, which gave them the so-called shaven-beard appearance.

"Between the simple inflammatory enlargement of the closed glands, which I have pictured, and the more luxuriant process which occurs in ordinary typhoid, and which most pathologists believe to be specific, every possible transition existed.

"I, for one, confess myself unable to draw a line between the two conditions. Anatomically, they appear to pass into each other by insensible gradations. The sloughing and ulceration of the so-called typhous process is, I think, sufficiently well explained by the intensity of the process, and the nutritive disturbances which thence result, without conjuring up in our imagination an undemonstrated specific something to account for it."

This view seems to me entirely correct. These cases were properly designated typho-malarial.

The so-called typhous process is now recognized by other pathologists besides Dr. Woodward, as simply an acute inflammation, devoid of specificity, of the solitary and agminate glands of the small intestine, and of the glands of the mesentery.

The matter with which these glands are big is composed of cells, white blood-corpuscles which, according to Cohnheim's view of the inflammatory process, have migrated from the small veins; and others resulting from proliferation of the peculiar cells which constitute the parenchyma of the glands. For a full account of the histological changes in the inflamed intestines I refer to "Med. and Surg. Hist. of the War of the Rebellion," Med. Vol. Part Second; to Dr. John Harley's article on Typhoid Fever in Reynolds's "System of Medicine;" and to Liebermeister's article in Ziems-

sen's "Cyclopædia." According to Dr. Harley's observations which were made in King's College and the London Fever Hospital, in rare cases of typhoid the solitary glands alone are affected. In the extensive autopsical investigations made at Basle, by Hoffman, in conjunction with Liebermeister, it was established that in some of the cases the pathological processes did not go beyond the stage of simple swelling of the solitary and Peyer's glands. There was no ulceration or loss of tissue. The patches and follicles returned to their normal condition through the influence of degeneration and absorption. Numerous little ecchymoses were found, oftentimes producing a punctate pigmentation of the swollen patches—the shaven-beard appearance of Woodward. (Ziemssen's "Cyclopædia," vol. i. p. 102.) Hoffinan found that the glandular enlargement was "produced essentially by an excessive development and multiplication of the cellular elements."

This hybrid disease which Dr. Woodward has brought so graphically before us is, however, not a new one. He himself has shown that it was the scourge which, under the names of Hungarian Fever and Walcheren Fever, decimated the armies of Europe, during the sixteenth and eighteenth centuries. Trousseau, the great clinical teacher of the Hôtel Dieu, has graphically described one of these compound forms of fever, and tells us that "it is particularly in districts where marsh fevers are endemic, and in persons who have not long been absent from such localities, that we see them." Among the ancients who observed and drew clinical pictures of the forms of disease we are discussing, were (I quote from Trousseau) Sydenham, Morton, Huxham, Van Swieten, and Stoll. Dr. Drake, in the "Diseases of the Interior Valley," has given an account of these hybrids, and proposed to designate them by the term *remitto-typhous*; and Professor Dickson of Philadelphia clearly recognized them, so that there can be no doubt of their entity, or of the truth of the clinical picture which has been presented to you.

What can possibly be more explicit than this from Bartlett, p. 133:—

"Typhoid fever, like all other continued affections, is sometimes more or less mixed up with and influenced by the pathological element of periodicity. Dr. Wooten, of Lowndesboro, Alabama, in a letter to me, says: I may remark that I have often seen typhoid fever complicated with regular remittance—that is typhoid fever and remittent fever existing together; and I have cured the paroxysmal exacerbations whilst the disease essential to typhoid continued; and I have frequently found it necessary to do this before the more formidable disease could be influenced by remedies."

In regard to the general question of hybridity as applied to diseases, there can at this day be no doubt. The disease called by the Germans, *Rötheln*, is clearly a compound resulting from the poisons of scarlatina and measles. The poisons of typhus and typhoid occasionally combine to give us another hybrid.

"It cannot be questioned that cases of fever are met with from time to time, though unfrequently, in which the phenomena of both forms of disease are pre-

sent in the individual. In a paper on the coexistence of several morbid poisons, in the 24th vol. *Medico-Chirurgical Review*, Dr. Murchison gives several most illustrative cases of this hybrid disease."

Sir D. Corrigan gives an admirable example in the tenth lecture of his work on Fever. (Hudson on "Fever," p. 65.)

Thirdly, the existence of a hybrid between typhoid and malarial has been conclusively settled by Dr. Woodward's researches. But although such forms of disease exist, it should be remembered that, in civil practice at least, they are very rare.

Thus Hudson says of the compound of typhus and typhoid, "that while the occasional occurrence of a hybrid disease is unquestioned, this is so infrequent and exceptional as really to prove the rule." And Dr. Woodward remarks, "that, whenever an army, recruited in a comparatively non-malarial region, campaigns on a malarial soil, such hybrid forms will appear; and that, sporadically, such cases will appear in civil practice in miasmatic regions."

Appealing to my own observation, I can furnish but a single case of typho-malarial, and, as this was studied with care, its history and thermometric range are herewith presented as illustrating all the clinical points in a typical case.

CASE XI. *Typho-Malarial Fever*. (Chart 11.)—Mrs. B., æt. 25 years, was attacked, October 2d, with fever introduced by chill, and accompanied with nausea, and vomiting of bile, and diarrhœa. Bilious vomiting and purging continued to such an extent that morphia, hypodermically, was required to control it. As the stomach was still very irritable, on 5th October an attempt was made to administer quinia by the rectum, but after three injections it was abandoned, because it was not retained.

On the fifth day of her illness, the fever having continued with regular evening exacerbations and morning remissions, almost complete deferescence occurred, and I believed, then, my diagnosis of bilious remittent confirmed.

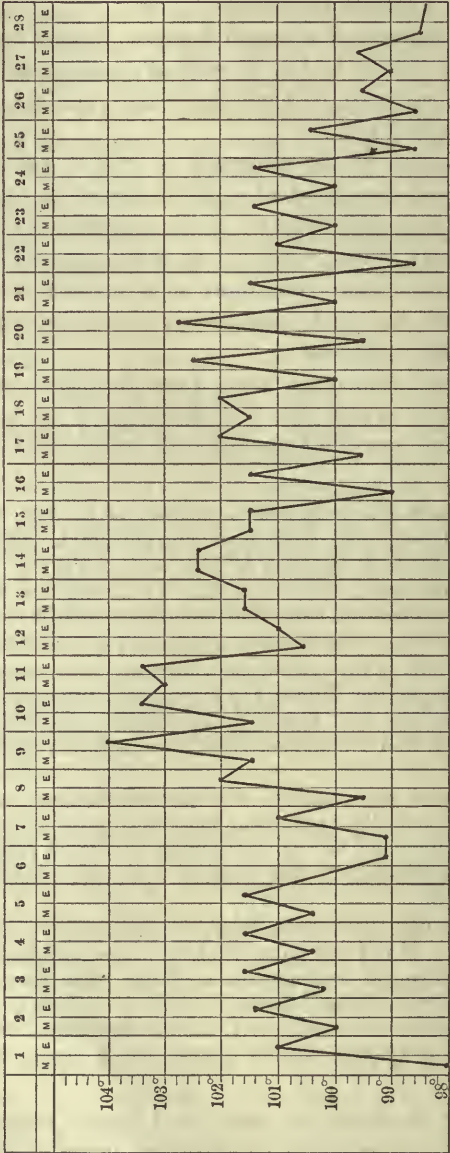
On the sixth and seventh days she was comfortable, and the temperature did not go above $99\frac{1}{2}^{\circ}$; but, on the evening of the seventh, though she had kept her bed, and had taken nothing but liquid food, and had been guilty of no imprudence, the temperature rose, and vomiting of bile and diarrhœa returned.

On the eighth day the temperature rose still higher, and on the ninth it reached 104° . It did not go much below this until the twelfth, which was five days since the reaccession of fever. On that day an abrupt fall to $100\frac{1}{2}^{\circ}$ occurred, without assignable cause. From this it again rose, pursued a comparatively continuous course for several days, and then went on in the zigzag lines which are observed during the last days of typhoid.

In this history we observe the gastric and hepatic symptoms of bilious remittent; and a thermometric range which presents, first, the typical features of a bilious remittent terminating on the fifth day; a lull; and then another curve, marked by tendency to subside on the fifth day also, and finally the range of typhoid fever; covering in all twenty-eight days.

In addition to these features well-marked typhoid symptoms made their appearance early. There were deafness and dulness of mind, with the typhoid facies: great dryness of the mouth, throat, and nares, and fre-

Chart 11.



quent epistaxis; a rapid feeble pulse demanding stimulants, which is an exceedingly rare occurrence in malarial continued fever, in my observation. The pulse ranged from 110 to 130 per minute. There were meteor-

ism, ileo-cæcal tenderness and gurgling, troublesome diarrhœa, and a copious eruption of rose-coloured lenticular spots over the abdomen.

The rose-coloured spots were observed for the first time on the thirteenth day of fever, about twenty in number; they came out in successive crops until the approach of convalescence.

On the eighteenth day of fever the urine was slightly albuminous, and continued so for several days. Bronchial cough was a troublesome symptom. Fever left her on the twenty-eighth day, and convalescence was uninterrupted.

After the trial with quinia no medicine of any kind was administered, except occasionally a very small dose of morphia, hypodermically, at night, to allay restlessness and procure sleep.

I have said that this is the only case of typho-malarial which has come under my observation. It is certainly the only one I have recognized.

It should be remembered, however, that my field of observation has been one in which the typhoid poison has not been operative, to any marked extent, until within the past year. In the future it is possible that the blending of the two types may be more frequently observed here; but my impression is, that typho-malarial fever will possess its chief interest for the military surgeon, and will be seen, to a limited extent only, in civil practice.

ARTICLE X.

A STUDY OF NON-MALIGNANT ULCERATION OF THE RECTUM AND ANUS.

By CHARLES B. KELSEY, M.D., Surgeon to the Infirmary for Diseases of the Rectum, New York, etc.

THE many different varieties of non-malignant ulcers which are met with at the anus and within the rectum, may best be classified from the standpoint of etiology; and for the sake of simplicity we shall divide them into the simple, tubercular, serofulous, dysenteric, venereal, those due to stricture, and those due to the gangrene following the severe fevers.

I. *Simple Ulcers*.—These are almost always of traumatic origin, and the most frequent traumatism to which the rectum is subject is perhaps that arising from the presence and passage of hard masses of feces. From this cause alone, or combined with their extrusion from the anus, the surface of projecting hemorrhoidal tumours may become ulcerated for a considerable extent; and by this means a fissure is often produced within the grasp of the sphincter. The latter I have known to happen on the first evacuation after an operation for hemorrhoids (the bowels having been confined for several days), rendering necessary the usual operation for its cure. Another frequent cause of direct injury is the presence of foreign bodies—either fish-bones, date-stones, etc., which have been swallowed; or larger substances which have been intentionally introduced per anum. In the removal of such substances fatal injury may be done by laceration; or

their presence may have already excited extensive ulceration which will lead to subsequent stricture. In the removal of glass bottles, cups, etc., the greatest care and gentleness are necessary to avoid breakage, and a laparotomy may often be preferable at the outset, as offering less risk to the patient than a prolonged and perhaps in the end unsuccessful attempt at extraction with the forceps. And just here I will stop to say that the existence of a soda-water bottle or a chocolate-cup in the human rectum is *prima facie* evidence of an evil habit on the part of the bearer. The explanations given of their presence are as various as those used to account for the hair-pins, etc., which are found in the female bladder and vagina, and they mean very much the same.

An infrequent cause of direct violence to the rectum and of subsequent ulceration due to the direct injury, and independent of any venereal disease, is sodomy either attempted or accomplished. Burgeon¹ describes the rectum of an idiot who for a considerable time had practised this vice as much dilated and infundibuliform in shape, the mucous membrane as blackish, swollen, and ulcerated at points, and the muscular and submucous layers as hypertrophied to four or five lines in thickness. It is doubtful whether pederasty should be included among the causes of stricture, as the injury done generally does not reach this extent; and indeed the anus is not often dilated to any such extent as in this case. Ligg² describes a deaf-mute 35 or 40 years of age, the victim of this habit, whose anus offered no trace of traumatism, and was well closed, being marked only by the absence of the radiating folds. The mucous membrane was normal. This absence of the radiating folds, together with the presence of spermatozoa in the rectum or in the mucous discharge from it, are given as the best medico-legal proofs of the vice. The only sodomists it has ever been my fortune to meet have been negroes, and of these I have seen several.

An injury to which women alone are subject, and which is believed by many to go far towards accounting for the greater frequency of ulceration and stricture in them than in men, is bruising of the rectal wall between the head of the fœtus and the sacrum in parturition. Van Buren³ relates such a case from his own experience, and most of the other standard authors agree with him.

An ulcer of the rectum is a not infrequent result of surgical interference with diseases of the part. Although in certain subjects a wound made by the surgeon may refuse to heal under the best of treatment, I have more frequently seen ulceration from this cause as a result of careless or ignorant manipulation, than of the unfortunate constitutional state of the patient. Two cases occur to me now, one of a large ulcer with hard and

¹ Bull. de la Soc. Anat., 1830, p. 80.

² Corr. Bl. f. schweiz. aerzte., No. 3, p. 71, Feb. 1, 1879.

³ Arch. of Med., December, 1879.

elevated edges looking much like a true chancre, which resulted from the persistent application of caustics to a simple fissure; and another of three separate ulcers which marked the former site of three internal hemorrhoids which had been removed by ligatures. The patient suffered only slight discomfort from the operation, and was allowed to go to his business on the following day, a thing which may sometimes be done with apparent impunity, but which should never be countenanced by the operator. It is this danger of ulceration which stands in the way of the general adoption of carbolic acid injections in the treatment of hemorrhoids.¹

The application of nitric acid to prolapse is said to have been followed by disastrous ulceration and stricture, but such need not be the case; nor is any such use of the acid necessary to effect a cure in any case where its use is indicated at all. Prolapse is not, however, a rare cause of stricture, due to the strangulation and sloughing of the prolapsed part, and to the subsequent cicatrization.

An injury due to any of the causes we have mentioned may in certain persons, and when located at the verge of the anus, assume the characteristics of an affection which has been elevated into a separate class and is known as fissure or irritable ulcer. The irritable ulcer differs in no respect from other simple ulcers in the same locality except in the fact of its irritability. It would require a special article to deal thoroughly with all the questions which have arisen in regard to this affection, and we can only call attention to two chief theories concerning it. According to Boyer² the spasm of the sphincter is the foundation of the trouble and the fissure is a secondary lesion due to the passage of feces through the spasmodically contracted anus. Trousseau,³ on the other hand, reverses the relation, and believes that the fissure exists first, and that the pain and spasm are reflex, being specially apt to occur in persons of neuralgic tendency, and being in many cases merely the local manifestation of a general nervous state. The only point we wish to emphasize is that there is nothing peculiar in the ulcerative action of the painful fissure; and that any fissure may become an irritable one, or may remain for years causing little suffering. For this reason Gosselin⁴ has divided them into two distinct varieties, the tolerant and intolerant—a classification which Mollière⁵ still further improves by suggesting the words tolerable and intolerable.

An eruption of herpes around the anus similar to what is seen on the lips may result after rupture of the primary vesicles in numerous small superficial ulcers of a reddish colour and secreting very little pus. These

¹ Matthews, Objections to the use of Carbolic Acid in the Treatment of Piles. Reprint from *Amer. Med. Bi-Weekly*, April 27, 1878.

² *Traité des Maladies Chirurg.*, t. x. p. 105. ³ *Clin. Méd.*, t. iii., art. Fissure.

⁴ *Dict. de Méd. et de Chirurg. Pract.*, art. Anus.

⁵ *Maladies du Rectum et de l'Anus*, p. 149.

may coalesce at their edges and form a serpiginous sore. They are apt to be accompanied by similar eruptions in other parts of the body, and must be carefully distinguished from both mucous patches and soft chancre. The ulcerations which result from acute and chronic eczema, and from pruritus present no special characteristics. They are generally due to the injury inflicted by the nails of the sufferer.

From what has been said of the etiology of this class of ulcers it is plain that they must present many variations in appearance; yet the diagnosis of each from the other, and of the whole class from those which are to follow, will not generally be found difficult if proper attention is given to the history, the appearance of the lesion, and its course. The disease is generally of a healthy type, and tends to self-limitation and spontaneous cure rather than to increase. The ulcerative action is generally superficial, and tends to extend on the surface rather than in depth. It is generally surrounded by the signs of reparative action, and with proper care will undergo cicatrization which when extensive will result in stricture.

II. *Tubercular*.—There are two varieties of ulceration met with in persons of the tubercular diathesis; one due to the actual deposit and softening of tubercle, the other a simple ulceration containing no tubercular deposit but modified in its course by the patient's general condition of malnutrition. The former may properly be called tubercular ulceration, and the latter is better known as the ulceration of the tuberculous. The former is a very rare form of disease. It may occur in the rectal pouch, but its favourite site is at the verge of the anus where it may exist before any general manifestation of tuberculosis. Whether or not it is ever primary in the rectum proper is a point not yet decided. The characters by which such an ulcer may be recognized are its pale red surface covered with a small quantity of serum but devoid of healthy pus and appearing as if varnished; the absence of all surrounding inflammation and of the granulations which exist in a healthy sore; its tendency to spread on the surface rather than in depth; the absence of any great amount of pain; the regular outline ending abruptly in healthy skin; and above all, its chronicity and the utter failure of all remedies to affect its steady course. The diagnosis may be confirmed by the microscope.¹

Whether such an ulcer is ever a cause of stricture is doubtful, it being doubtful whether a truly tubercular ulceration ever heals, or, in other

¹ In the excellent monograph of Féau et Malassez, *Etude Clinique sur les Ulcérations anales*, Paris, 1872, there may be found the history of a case of this kind with the microscopic report of Cornil, and a drawing of the microscopic appearances. Gosse- lin also has given a clinical lecture on a similar case in the *Gaz. Méd de Paris*, Mar. 27, 1880, calling attention to the main points in the diagnosis and treatment. Other literature of the subject may be found in Habershon *On the Diseases of the Abdomen*, London, 1862, p. 302 *et seq.*, and Mollière, *op. cit.*, p. 647. Allingham also speaks of cases in which the diagnosis was confirmed by Paget, and remarks parenthetically that the disease is not as rare as is generally supposed.

words, results in the formation of contractile tissue. Such a sore starting in the walls of the rectum may result in perforation and fistula (fistula with large internal opening), and, as a matter of course, the usual operation on such a case would be followed only by disappointment. The treatment is generally only palliative. Mollière asks whether, if such an ulcer were completely extirpated or destroyed, before general symptoms had shown themselves, it might not be possible to prevent the general manifestation of the disease, as may be done in cases of tubercular testis. He bases the question on a case in which such an ulcer existed nearly four years before any other signs of tuberculosis were manifest.¹

The other variety of this form of disease (the non-tubercular ulcer in the tuberculous person) is a simple sore modified in its course and character by the presence of the tubercular diathesis. It may result from any of the causes already mentioned, and many of the varieties already described may, under the proper conditions, assume its characteristics. It may occur either in the rectum or at the anus, and may vary in size from a mere spot a quarter of an inch in diameter to a sore covering the whole lower part of the rectum. It may extend in depth as well as on the surface, may perforate and cause fistulæ, or be attended with thickening of the wall without decrease in calibre. It is often attended by polypoid growths, it is painful, and the discharge is purulent. It neither extends rapidly nor heals easily, and yet it is surrounded by a healthy reparative action, and, unlike the true tubercular sore, it may be induced to heal, and is one of the causes of grave stricture. The process is essentially a chronic one, and several of the cases of "chronic ulceration of the rectum" reported by Curling, come properly under this category. It may easily be distinguished from true tubercle, but may readily be confounded with some of the varieties which are to follow.

III. *Scrofula*.—Allied to the class of ulcers last mentioned are those in which the scrofulous taint manifests itself, as it may do either in follicular ulcers of the rectum and large intestine, in lupus or esthiomène, or in rodent ulcer. The last two affect primarily the anus and perineum. Follicular ulceration is due to a chronic inflammation and fatty degeneration of the follicles of the rectum. These which first appear as small caseous nodules, break and leave small deeply excavated ulcers, which, being multiple, may coalesce and form larger ones of the chronic variety, capable of subsequent healing with the formation of cicatricial tissue. They may perforate the bowel and cause fistulæ when low down, or peritonitis when higher up. They may be only one of many manifestations of the scrofulous tendency in the same patient, and they often coexist with pulmonary disease.

Under the title of esthiomène (lupus exedens of the ano-vulvar region) a number of phagedenic ulcerations complicated with more or less hyper-

¹ Op. cit., p. 651.

trophy of the nature of elephantiasis have probably been described; but in spite of confusion of statement, this would seem to be a rare manifestation of scrofula which may precede any others. It commonly starts from the external organs of generation in the female, and only secondarily invades the anus and rectum. It is almost never seen in men. Its favourite starting point is in the perineum, and instead of being superficial, it may be perforating, and may produce great loss of tissue, turning the rectum and vagina into one cavity. At this stage other ulcers are apt to appear in the rectum or colon, causing diarrhoea and peritonitis; but whether these are of the variety just described as follicular, or are due to further deposits of lupus, is a question not yet answered. The ulcer is irregular in outline, with a granular base of a violet-red colour, and there is a slight sanious discharge. The edges are but little elevated, and are not undermined, and there is more or less hypertrophy of the surrounding tissue. It may cicatrize in part, the cicatrix being thin and white, at the same time that the ulcerative process is extending in the opposite direction. At a little distance from the ulcer there is often a pathognomonic appearance of slight, reddish, hard nodules of tubercular lupus separated from the primary sore by healthy skin. With this amount of disease the constitutional disturbance is often not sufficient to confine the patient to the house. The diagnosis is not generally difficult, though it may be confounded with cancer, phagedenic chancre, and with elephantiasis with secondary ulceration. It is best distinguished from cancer by the cicatricial bands which it leaves behind; and from chancre by the surrounding tubercles which in lupus develop in the thickness of the derma and ulcerate secondarily, while the ulcers surrounding chancres are ulcerous from the first, being due to secondary inoculation. Van Buren¹ advances the theory that most of these ulcerations are due to the grafting of the syphilitic poison upon the scrofulous diathesis in women of improper habits. The duration of the disease is indefinite, and it seldom leads to fatal results. It is best treated by destructive cauterization and reclage.²

Rodent ulcer is very closely allied to epithelioma, and may in fact be considered one of its varieties, but it is distinguished from it clinically by the fact that it does not infiltrate surrounding tissues, does not involve the lymphatics, and does not become generalized. It is the same disease met with upon the face, and is exceedingly rare at the anus, being seen only twice in four thousand consecutive cases at St. Mark's Hospital, so rare indeed that Allingham has never seen but fourteen cases. According to his classical description it is found by preference at the verge of the anus, and extending from this point upwards into the rectum. It is irregular in shape, and its edges end abruptly in healthy tissue. Its sur-

¹ Loc. cit., p. 240.

² The best descriptions of this disease will be found in Hugulier, *Mem. Acad. de Méd.* 1849; Harday, *Scrofule et Scrofulides*, p. 80; and Féan et Malassez, *op. cit.*

face is red and dry ; it destroys superficially, attacking mucous membrane rather than skin, and undergoes rapid but only partial cicatrization under proper local and constitutional treatment. It never entirely heals, and is not to be included among the causes of stricture. It is at first generally mistaken for a late syphilitic manifestation, but is distinguished from it by the powerlessness of all treatment to prevent its steady progress. It is one of the most painful of all the ulcerative affections of this part, and ends fatally unless some other form of disease cuts short the history. It is best treated by complete excision, and this in one case of Allingham's secured immunity for a period of four years during which the patient was under observation.

IV. *Dysentery*.—In dysenteric ulceration, the diseased portion of the lower bowel becomes infiltrated with fibrinous exudation, and, as a result of the compression which this exercises, is necrosed and sloughs. When the slough is cast off there results a loss of substance, and if this is superficial the membrane may regain its former state, but if deep the usual callous cicatrix is produced in its place and stricture is the result. The ulcers resulting from this process vary much in size, location, and appearance. They may be minute circles, but are generally large, and, though their favourite site is the rectum and sigmoid flexure, they may be found over the whole length of the large intestine. They may extend so as to coalesce and leave only islands of mucous membrane between the extensive patches. The process usually involves only the mucous coat, but may extend in depth and result in perforation and its attendant evils. The coats of the bowel may become sinuous abscesses, so that, on dividing the prominent portion of the mucous membrane between two ulcers, several drachms of pus may escape (Habershon). Although all the symptoms of dysentery may result from ulceration due to other causes, as in Annandale's case,¹ there is no doubt that in this country the disease is one of the causes of chronic ulceration and stricture, and Habershon concludes that the disease is more common in our climate than is generally supposed.

In the "Medical and Surgical History of the War of the Rebellion,"² Dr. Woodward remarks that stricture resulting from dysenteric ulceration seems to have been much rarer than might have been supposed, and that no case has been reported at the Surgeon-General's Office either during the war or since ; that the Army Medical Museum does not contain a single specimen ; nor has he found in the American medical journals any case substantiated by *post-mortem* examination in which this condition is reported to have followed a flux contracted during the civil war. Although I cannot substantiate my case by *post-mortem* examination, I have now under treatment a soldier in the late war with two cicatricial strictures of the rectum which seem to be due to this cause. The man is awaiting the result of his application for a pension before submitting to colotomy. The

¹ Brit. Med. Journ., p. 681, 1872.

² Part II., vol. I., Med. Hist.

strictures are both within easy reach of the finger, the lower just within the internal sphincter, and the upper about an inch further up. The amount of cicatricial tissue is very extensive, the anus is patulous, and surrounded by the largest tags of skin I have ever seen in a case of ulceration. One of them measures an inch and a half in length by one inch in breadth. The rectal calibre does not admit of the passage of the index finger. There is nothing in the man's history to make me suspect syphilis. In a case of such extensive disease as this the diagnosis from scirrhus is only to be made by the history and the microscope.

V. *Venereal*.—A gonorrhœa of the rectum may be due to direct contact and inoculation in unnatural intercourse with a person suffering from gonorrhœa, or to accidental inoculation on the same person—in females by the flowing downwards of the discharge from the vagina to the anus, in males, by carrying the pus directly from the penis into the rectum. Rollet reports a case of the latter kind in a patient who was in the habit of passing his finger into his rectum to provoke an evacuation. The disease is a very rare one. Requin¹ believes it almost sure to follow unnatural intercourse with a person suffering from gonorrhœa, while Tardieu,² on the contrary, has never observed a single case. Gosselin³ saw only one case at the Lourcine Hospital in three years, and Vidal de Cassis also makes note of its extreme rarity.⁴ Mollière,⁵ though not committing himself on the specific nature of the rectitis observed after inoculation with a gonorrhœal discharge, believes that the ulcerations thus resulting may end in stricture. During the height of the inflammation the rectum is hot, red, swollen, and granular in appearance, and there is an abundant purulent discharge, coming from the anus from time to time in clots. The irritation of this discharge, whether coming from the rectum or vagina, will cause erosions and fissures at the anus, which may attain a considerable size; or a previously existing fissure may become inoculated in this way and spread up into the rectum.

Chancroids.—One of the most frequent of all the superficial ulcerations at the anus is the soft chancre. It is said by Péan et Malassez to have constituted nearly one-half of all the ulcerations in this region examined at the Lourcine in 1868. It is much more common in females than in males, constituting one in nine cases of chancroids in the former, and one in four hundred and forty-five in the latter.⁶ To account for this greater relative frequency only two things are necessary, the frequency of accidental contact of the male organ in coition, and the facility of auto-inoculation which is due to the proximity of the vulva and vagina. They are seen either on the skin around the anal orifice, or just within the canal,

¹ *Éléments de Path. Méd. Rectite*, t. i. p. 729.

² *Études Médico-légales sur les attentates aux Mœurs*, 4th ed., 1862, p. 179.

³ *Retrécissements Syph. du Rectum*, Arch. Géo. de Méd., 1854.

⁴ Dict. Encyc., art. Rectum.

⁵ Op. cit., p. 283.

⁶ Fournier, Dict. de Méd. et de Chirurg. Prat., art. Chancre, p. 72.

and show a decided tendency not to pass above the upper border of the internal sphincter. So marked is this trait that their existence in the rectum proper has been denied, and the mucous membrane supposed to furnish no suitable ground for their inoculation. They may be single or multiple, may be situated at any point in the anal circumference, or may completely surround it. In one case under my care, the anus was completely surrounded by a group of these sores, and the ulceration extended from the posterior commissure backwards in the intergluteal fold its whole length, as far as the top of the sacrum, being superficial, however, in the whole of its course. In such a case the pain will generally be found very severe; a careful examination is impossible without ether, and there is apt to be free hemorrhage. The bleeding at the time of defecation was the chief cause of alarm to the patient in the above case. These sores have the characteristics of the soft chancre in other parts of the body. The class of women in whom they occur is always an aid to the diagnosis, and if suspicion as to their nature exists the test of auto-inoculation may always be tried.

Sores of this variety tend to spontaneous cure with cleanliness, and, if necessary, with judicious cauterization, and no matter how completely they may have involved the anus, or the skin around it, they seldom leave any traces of their former existence. On the other hand, the cure may be delayed, even for months, and the sore may assume a chronic type, due either to the existence of other disease in the rectum, as hemorrhoids, or to a syphilitic or scrofulous taint in the patient. They may be complicated by chronic œdema of the surrounding parts, and resemble the lupus exedens already mentioned, or by the gangrenous process known as phagedæna, generally of the chronic variety, and advancing in one place while healing in another.

And now we come to the debatable ground upon which so much has been said and written, and about which much remains still to be learned. Do these soft chancres ever cause stricture of the rectum, and are they the most common cause of those grave strictures so often met in women who have had syphilis, and which are generally known as syphilitic? In the light of our present knowledge, and subject to such modifications of opinion as future experience may teach, we shall answer yes to the first of these questions, and no to the second. That a soft chancre may extend into the rectum and cause great destruction, may cicatrize and leave stricture, is beyond doubt. Van Buren¹ says, "I have certainly seen this in several cases, but only in women;" Bumstead and Taylor² speak in the same way; Mollière³ says, "Nevertheless, the soft chancre of the rectum does exist, and has even been seen to assume frightful proportions in this deep region;" and Bridge's⁴ case is generally considered as conclusive,

¹ Op. cit., p. 243.

² Venereal Dis. Phila. 1879.

³ Op. cit., p. 677.

⁴ Arch. of Dermatology, Jan. 1876.

though its authority rests more upon the well-known character of the men who pronounced judgment upon it than upon the published record, for there is a strong suspicion of syphilis, and no account of the test of auto-inoculation.

Dr. Mason's¹ paper, to prove the chancreoid nature of this kind of ulceration and stricture, has this advantage over the similar one by Gosselin,² that he unhesitatingly adopts the dualistic theory, and leaves the reader in no doubt as to what he means by the chancroid. That this is not the case in the latter article one may readily convince himself by a careful perusal, and for my own part I am unable to see where, in this justly celebrated article, the non-syphilitic nature of the disease in question is taught; for the author leaves us in absolute ignorance as to which of the two at present well-known varieties of "chancre" is, in his opinion, the primary cause of the stricture; and it is rather by inference than otherwise that his "chancre" is interpreted to mean chancroid. The idea left on the mind of the reader is not that the disease is not syphilitic, but that it is neither a primary, secondary, nor tertiary manifestation of syphilis as such are generally understood, but something developed in the neighbourhood of the primary sore. Gosselin, though he comes nearer to it than had ever been done before, just missed enunciating the chancreoid nature of these strictures, though Bassereau had distinguished between the two chancres two years before. What he does assert is that they are not to be considered as manifestations of constitutional syphilis, but that they are of local character, "due to a special modification of the vitality of the tissues contaminated by the virus of the chancre, comparable to the lengthening and hypertrophy of the prepuce with contraction of its orifice, which follows a chancre on its under surface in which the disease is evidently neither an œdema, nor a specific induration, nor a constitutional affection, but, a local lesion due to the presence of the chancres, and consecutive to the inflammation which they have caused." In the same class of lesions he places hypertrophy of the labia, condylomata, and other vegetations.

The weight of evidence then is decidedly in favour of the occasional causation of stricture by chancroid; but that all of the many so-called syphilitic strictures are not due to this cause is rendered probable by the fact that a large proportion of them are developed late in the course of true syphilis, and are not preceded by any ulceration, either chancreoid or otherwise, at the anus, but start at a point well within the sphincter muscle. Of their true nature we shall speak later.

True chancre at the anus is not very uncommon. Though Péan et Malassez saw only one case at the Lourcine in 1868, they explain the fact by the slight local disturbance which the sore causes—so slight that the

¹ Amer. Journ. of the Med. Sci., Jan. 1873, p. 22.

² Arch. Gén. de Méd., 1854.

patients do not seek treatment. They give the proportion in this place as compared to chancres in other parts of the body as one in sixty-eight; and as much more frequent in women than in men (one in thirteen in the former to one in one hundred and seventy-seven in the latter). These figures are about the same as those reached by Jullien. In the female, a sore in this locality is easily accounted for by accidental inoculation; in the male, by sodomy. They are most likely to be mistaken for simple fissures, but they have a hard, raised outline and indurated base, are less painful, and devoid of the healthy surface of the former. In any case of suspicion constitutional treatment should not be commenced till the diagnosis is completed by the appearance of general symptoms.

True chancre within the rectum is very rare indeed. Ricord, Fournier, and Vidal de Cassis each reports a single case, and in the latter the induration was said to have been so great as to cause stricture.¹ Mollière carefully analyzes the evidence on this point up to date, and concludes that though a true chancre may exist in the rectum, it never causes stricture, for the reason that the chancre does not produce any great amount of ulceration, and that the induration tends to spontaneous resolution, or at least rapidly yields to the influence of mercury. The difficulties surrounding the diagnosis of such a sore are manifest. Its mere appearance would scarce be conclusive, and in women the absence of any other sore which might lead to secondary symptoms would need to be absolutely proved—a very difficult thing to do.

Secondary Syphilis.—Two of the secondary manifestations of syphilis are to be looked for at the anus and rectum. The first is the mucous patch, not an infrequent sign in the former locality; and one liable to assume ulcerative action from local irritation or inoculation with the virus of the chancroid. Generally, however, they are devoid of symptoms and disappear either without treatment, or simply with cleanliness and the use of an astringent wash. That the mucous patch may appear in the rectal pouch also, is probable from analogy, and such cases have been reported,² but as they never form cicatrices they must be counted out of the etiology of stricture.

Well-marked cases of secondary ulceration in the rectum, such as are seen in the mouth and throat, have never been reported, and yet that they exist and may cause extensive destruction is rendered very probable from analogy. I have seen two cases in syphilitic women where I found no more plausible explanation of the presence of extensive ulceration and stricture than this. In both the disease began well within the rectum and was not chancroidal; and in both it began as ulceration, and was not therefore what we shall soon speak of as ano-rectal syphiloma. In one it coincided with a late secondary eruption, but though the eruption yielded promptly to general treatment the ulceration did not. As, however,

¹ Van Buren.

² Mollière, p. 641.

neither of the cases was conclusive, I hesitate to speak more positively than this, merely suggesting, as has been done before, this as a not uncommon cause of many of the syphilitic strictures.

Tertiary Lesions.—The tertiary manifestations of syphilis liable to occur in this part of the body are ulcerations, gummata, and ano-rectal syphiloma. The ulcerations have the same characters here as elsewhere; their favourite site is at the anus, and they generally do not extend far within it: though they may begin in the rectum and only involve the anus secondarily, this is very rare. They are essentially chronic in course, give rise to all the symptoms which ulcers in this part generally give, and are most effectually treated by combined general and local measures.¹

Gummata also may affect either anus or rectum, though their rarity in the latter may best be judged by the statement of Fournier,² that he has never seen one, and only admits their existence on the testimony of Verneuil, who has seen one. However, their presence, *a fortiori* probable, has been demonstrated by other observers than Verneuil. Esmarch³ admits it; Zeissl⁴ reports a case in a male, and Zappala⁵ another; Mollière⁶ has seen one starting at the anus and extending into the ischio-rectal fossa; and Fournier⁷ met with one in a young woman starting in the left buttock and secondarily involving the anus and then the rectum.

The ano-rectal syphiloma described by Fournier is not primarily an ulceration, but it leads to ulceration, and according to him is the most common cause of stricture of the rectum of which we have spoken in connection with the chancroid. It is defined by him as “an infiltration of the ano-rectal walls by a neoplasm, whose initial structure is still undetermined, but susceptible of degenerating into retractile fibrous tissue and of constituting in this way more or less extensive intestinal strictures.” He particularly emphasizes the fact that this process begins in the submucous layers, and that the mucous membrane is only secondarily destroyed, being at first entirely free from ulceration and from cicatrices. Its point of predilection is in the rectal pouch, but it may be found below. He has never seen it above. Sometimes only two or three centimetres of the wall are involved, but when it begins at the anus it may reach seven or eight centimetres up. It forms a cylinder around the whole circumference of the bowel. In the initial stages the rectum is only stiffened and thickened, but not contracted. When the infiltration is limited to the vicinity of the anus, it is not uniformly diffused around its circumference, but forms irregular masses which are at first covered by healthy tissue. These are painless unless inflamed, but are liable to erosion and ulceration. The disease

¹ See Fournier, *Lésions tertiaires de l'Anus et du Rectum*, Paris, 1875; and Vidal, *Leçons sur la Syphilis*, Paris, 1879.

² Op. cit., p. 8.

³ Pitha u. Billroth, *Handb.*, Erlangen, 1873.

⁴ *Vrtljschr. f. Dermatol. u. Syph.*, 1876, H. II.

⁵ *Ann. Univ. di Med.*, Milan, cexiii., 1870.

⁶ Op. cit., p. 645.

⁷ Op. cit.

is more common in females than in males—eight to one. Unfortunately the specific character of this induration cannot be proved by the microscope, there being nothing distinctive in its structure as there is in gummata. The theory advanced by Fournier has held its ground, however, and has gained adherents. Duplay¹ adopts it, and Van Buren has distinctly recognized this form of disease, and has also “seen it disappear under anti-syphilitic treatment,” though Fournier distinctly says, the anti-syphilitic treatment exercises no curative influence on confirmed syphilitic retraction, and this he accounts for on the ground that the contraction caused by syphilis is less a syphilitic lesion than the ultimate consequence of a syphilitic lesion, just as a cicatrix is the ultimate consequence of a wound. I have tried the plan of nicking and subsequent constant dilatation with a plug covered with mercurial ointment, recommended and so skilfully carried out by Dr. McMasters² in the treatment of one of these cases, but cannot recommend it, for I do not believe it will generally be borne. In my own case it became utterly intolerable in a few days, and finally caused pelvic cellulitis, an accident which Dr. Haupt, of St. Francis Hospital, informs me, has also befallen a similar case of his own.

VI. *Stricture*.—Not only is ulceration the most common cause of stricture, but any form of stricture is liable by its obstructive action to set up ulceration in the wall above. At first there is dilatation of the rectal pouch and hypertrophy of its walls, due to the effort to overcome the obstruction. In this way the coats may become double their natural thickness. Next an ulcerative action is set up in the mucous membrane, probably due to the irritation and traumatism of feces. Beginning as a simple congestion, it advances to complete destruction of the tissue over the whole circumference of the bowel, and for a distance sometimes of several inches above the stricture. As a result of this process the muscular layer may be entirely denuded, and perforated at a point high above the original disease.³

VII. The *gangrene* liable to follow the continued fevers, and particularly liable to affect the female genitals, may cause extensive sloughing and subsequent stricture. It is a form of disease to which attention need only be called to make the classification complete.

Diagnosis.—The existence of ulceration around the anus becomes manifest on the most cursory inspection, but there is but one way to determine its presence within the rectum, and that is one which the general practitioner seldom adopts. It is easier to give diarrhœa mixtures in the hope of a cure than to etherize a patient, and thoroughly explore the rectum for the sake of diagnosis; and for that reason many a case of curable disease has been allowed to reach an incurable stage before its existence

¹ Le Progrès Méd., Nov. 30, 1876.

² N. Y. Med. Jour., Oct. 1876.

³ See Mollière, p. 294; Gosselin, loc. cit.; Lancereaux, Bull. de la Soc. Anat., 1859; Malassez, Dict. Encyc., p. 728.

has been certainly determined. To the practised examiner much may be learned of the condition of the rectum by a simple digital examination, but to learn anything of ulceration alone in this way requires more practice than most surgeons or physicians ever attain. All attempts to pull open the anus, or to dilate it with cylindrical or fenestrated speculæ so as to see the mucous membrane of the rectal pouch, end only in dissatisfaction to the surgeon and useless pain to the patient. It is astonishing how well an ulcer of the rectum may be seen if approached properly in an etherized patient, through a thoroughly dilated sphincter, and with a Sims's speculum and good light. Approached in this way no one need be in doubt as to the existence of ulceration within four inches of the anus, and I cannot too strongly insist upon this point, for I well remember the sense of satisfaction which I experienced when, after a few trials of the wrong way, being deterred from the right by the trouble which necessarily attends the use of ether, I first began to make a practice of really *seeing* the condition of my patients. There is a certain train of symptoms, however, which render the existence of advanced ulceration extremely probable, and these have been so well described by Allingham that we can scarce do better than give them in his own words; merely stating that by their existence we have several times been able to predict, from the history of the patient, what condition would be found on examination, and to verify the prediction under ether.

"In the majority of these cases the earliest symptom is morning diarrhœa and that of a peculiar character, in my opinion quite indicative of the disease, and can only be confounded with cancer. The patient will tell you that the instant he gets out of bed he feels a most urgent desire to go to stool; he does so, but the result is not satisfactory. What he passes is generally wind, a little loose motion, and some discharge resembling 'coffee-grounds,' both in colour and consistency; occasionally the discharge is like the 'white of an unboiled egg,' or 'a jelly fish;' more rarely there is matter. The patient in all probability has tenesmus, and does not feel relieved; there is something of a burning and uncomfortable sensation, but not actual pain; before he is dressed very likely he has again to seek the closet; this time he passes more motion, often lumpy, and occasionally smeared with blood. It also may happen that after breakfast, taking hot tea or coffee, the bowels will again act; after this he feels all right, and goes about his business for the rest of the day, only, perhaps, being occasionally remained by a disagreeable sensation that he has something wrong with his bowel. After this condition has lasted for some months more or less, as influenced by the seat of the ulceration and the rapidity of its extension, the patient begins to have more burning pain after an evacuation, there is also greater straining and an increase in the quantity of discharge from the bowel; there is now not so much jelly-like matter, but more pus; more of the coffee-ground discharge and blood. The pain suffered is not very acute, but very wearying; described as like a dull tooth-ache, and it is induced now by much standing about or walking. At this stage of the complaint the diarrhœa comes on in the evening as well as the morning, and the patient's health begins to give way, only triflingly so, perhaps, but he is dyspeptic, loses his appetite, and has pain in the rectum during the night, which disturbs his rest; he also has wandering and apparently anomalous pains in the back, hips, down the leg, and sometimes in the penis."¹

¹ Allingham, op. cit., p. 219.

The existence of the ulceration being decided, its nature remains to be determined. We have already, in speaking of the different varieties, given some of the chief points in differential diagnosis, and to these we must again refer the reader. In all cases the history of the case must be taken into account as well as the appearances of the lesion. Of the many varieties we have mentioned, some may be almost certainly excluded from their great rarity. Amongst these are the true chancre, the tubercular deposit, lupus, and rodent ulcer. In the majority of cases, after excluding syphilis, the ulcers in the rectum proper will be of the simple nature first described, modified more or less by the general condition of the patient.

We need scarcely call attention to the extreme gravity of the disease under consideration, or to the certainty with which, if untreated, or sometimes with the best of treatment, it will end either fatally, or in a condition requiring the gravest surgical procedures for its relief. The picture is unfortunately a familiar one.

As to *treatment* we shall speak only of the treatment of the ulceration, and not of its most frequent secondary effect—stricture,¹ and this treatment may be summed up in a very few words. Two things are absolutely necessary—perfect rest and fluid diet, preferably milk. These alone will cure most of the cases that are curable, and without them no treatment will be of much avail. To them, however, other things may be added in the way of general medication and local applications. Cod-liver oil fulfils the double indication of tonic and laxative, and to it iron may often be added with advantage. The list of local remedies is a long one, bismuth, iodoform, and solutions of nitrate of silver being among the best. The former may be used in powder or as an enema; the iodoform is, perhaps, best applied as a suppository in a medium which is easily dissolved, and will not cause the irritation of a foreign body; and the nitrate of silver may be used either in weak or strong solutions according to the indication to be fulfilled. The same treatment applies to venereal ulcers at the anus as in other parts of the body, and it is readily seen why much more active treatment is applicable here than within the rectal pouch. Even here, however, destructive cauterization must be employed with great caution, if at all. The knife may be necessary and beneficial in two ways: first, for dividing the muscular fibres forming the base of the ulcer, whether within the rectum or at the verge of the anus; and second, for completely dividing the anus and its muscular ring down to the coccyx. The latter is a means of cure which need not be delayed till stricture has formed. One obstacle which will stand in the way of any successful treatment will always be the difficulty of inducing the patient to submit to the necessary restraint—for these cases do not generally cause any great amount of suffering at first, and patients can hardly be induced to believe in their

¹ See articles on Treatment of Stricture in New York Med. Journ., March, June, and December, 1880.

extreme gravity. After a more or less prolonged use of some quack remedy for the piles, they begin to pass from one doctor to another, and from one treatment to another, till nothing remains but the surgical procedures already hinted at.

NO. 48 EAST 30TH STREET, NEW YORK.

ARTICLE XI.

ODOR MORTIS, OR THE SMELL OF DEATH. By A. B. ISHAM, M.D., Professor of Materia Medica and Therapeutics in the Cincinnati College of Medicine and Surgery, Cincinnati, Ohio.

IN the Cincinnati *Clinic* of September 4, 1875, was published a paper on "Odor Mortis, or the Death Smell," read by me before the Cincinnati Academy of Medicine, Aug. 30, 1875. This paper was based upon observations made while an inmate of one of the surgical wards of Stanton General Hospital, Washington, during the summer of 1863, as well as upon instances in which the odour had been met with in private practice. The character of the odour was moschiferous, yet it appreciably, though almost indescribably, differed from that of musk. In this paper I desire to present two recent instances where this odour attracted notice, together with some new observations concerning it.

Instance 1. July 31, 1878, on the eve of Dr. Bartholow's departure for Europe, I was requested to assume charge of his patient Mr. ——. The patient was unconscious, with irregular, noisy respiration, with only a feeble trace of a pulse, indistinguishable at times, and was dying slowly from effusion within the membranes of the brain, the result of chronic alcoholism. I was with him through the middle of the night, and during this time noticed upon my right hand a smell resembling that of musk. This hand was exclusively used in examining the patient's pulse and in noting the temperature of his body. Earlier in the night there had been no smell upon it. The left hand acquired the same smell from handling the body, and it was also communicated to the handle of a fan held in the hand. A gentleman from Chicago who had volunteered as a night watcher, and whose attention had been called to the odour, without any suggestion to its character, promptly distinguished it. The ladies of the household did not use musk, and no perfumery had been in the room or about the patient. Neither had I handled or come in contact with anything, other than the patient, from which odour could be derived. Death occurred thirty-three hours later.

Instance 2. About midnight of May 11, 1879, was called to see M. G., æt. 7. Had several months previously been under my care with acute duodenitis, from which she had recovered, but with impaired digestion and defective assimilation. In consequence she had passed into the hands of an irregular practitioner. I found her in *articulo mortis* with general anasarca the result of blood dilution. Upon entering the room there was a plainly perceptible musky odour. There was no musk about the house,

nor had any other perfumery been employed. Death ensued in about an hour and a half.

The smell, as said, was most closely allied to that of musk, yet the impression upon the olfactory organs was more delicate, more subtle. Besides there was an indescribable feature pertaining to it which seemed to impress the respiratory sense, and trouble respiration—a vague sensation of an irrespirable or noxious gas. To the convalescent loungers of sharp olfactory sense about the ward of Stanton Hospital, the smell was familiar, and was termed the *death smell*. It was not uncommon to hear the expression, “Some one is dying, for I smell him.”

It was rare to find the odour widely diffused, and where it appeared to be, it was probably due to a continuance of the first impression upon the olfactory end organs. As commonly encountered, it has suggested the idea of a gaseous aggregation or body containing odoriferous particles possessing an attraction for each other and so held together. In the hospital ward, while present in one location, it was not experienced in another slightly removed. It also quickly disappeared from the first location, likely moved along by atmospheric waves. The vapour in which the odorous molecules were suspended appeared, in some instances at least, heavier than the atmospheric air. Thus I have sometimes recognized the smell in lower hallways, the patient occupying the upper portion of the house, and in Instance 1, already detailed, it was only detected upon handling the body. This affords one explanation why it may not more often claim recognition. From its heaviness it subsides and does not enter the organ of olfaction. Other reasons why it may escape attention are, that the olfactory sensibilities may be blunted by long continuance in an illy-ventilated, bad smelling sick-room; or the air currents may carry the odour in a direction not favourable for observation.

The only mention of an odour which may be analogous, I have seen in literature, is by Dr. Badgely, of Montreal, in a report on Irish emigrant fever. It is thus quoted by Drake in his work on the “Principal Diseases of the Interior Valley of America,” as taken from the *British American Journal*:—

“I hazard the idea that the ammoniacal odour emanating from the living body, so strong on opening the large cavities, and so striking on receiving some of the blood out of the vessels, arteries as well as veins, into the hand, were all due to the same condition of this fluid; the actual presence of ammoniacal salts, one of the surest proofs of the putrescent condition of the vital fluid; in fact, to speak paradoxically, of the *existence of death during life*.”

Here the source of the smell is indicated, as coming from the development of ammonia in decomposing blood. It is known that musk contains ammonia largely, together with a volatile oil which has never been isolated. Robiquet holds that its odour depends upon the decomposition of the ammonia liberating the volatile matters of the oil. The blood also contains a volatile oil, and it is familiar that it possesses odour. This odour

may be developed by adding sulphuric acid to blood and boiling. This process was formerly resorted to in order to distinguish blood in questionable cases, but it has been rendered obsolete since the discovery of the blood corpuscles by the microscope. Such a method would be well suited to drive off the ammonia, free from decomposition, together with the volatile oil—to which substances the odour is very likely due.

In my paper, referred to at the commencement, I was inclined to limit the occurrence of the manifestation to within a very short time of death. That it cannot be so restricted is evidenced by Instance 1, where it was encountered thirty-three hours before death. The conditions here were not unfavourable for its development. From the state of circulation, chemical changes were evidently proceeding in the blood, elevating its temperature and liberating those fugacious matters to which we would ascribe the origin of the death smell.

Richardson and Denis have shown by experiments that ammonia salts added to blood preserve its fluidity, by preventing the deposition of fibrin. This is not without a bearing upon the origin of the *odor mortis*. In gradual death coagulation commences first in the capillaries and proceeds towards the heart. The escape of ammonia from the blood in the peripheral vessels, liberating the volatile principles and engendering smell, permits local deposition of fibrin long before the heart has ceased its action.

But Lange has more recently investigated the action of ammonia in living and dead blood. He found that carbonate of ammonia added to living blood was only given off at a temperature of from 176° to 194° F. When, however, ammonia was added to blood from a dead animal it was evolved at a temperature of from 104° to 113° F. It is well ascertained that in many diseases, just previous to death, the blood temperature is raised above the lowest given by Lange. In some diseases, too, the blood heat falls below the normal body temperature. This affords another and principal explanation why the *odor mortis* may not be appreciable. These experiments of Lange also show why this smell is not developed by diseases characterized by great elevation of temperature—simply because the blood has lost none of its vital properties.

WALNUT HILLS, CINCINNATI, OHIO.

ARTICLE XII.

RENAL CALCULUS DISCHARGED FROM THE KIDNEY AND RETAINED IN ABDOMINAL WALLS SEVEN YEARS; REMOVAL. By R. L. REA, M.D., Professor of Anatomy in the Chicago Medical College, Chicago, Illinois.

Nov. 8, 1880, I was called in consultation by Dr. H. Tomboeken of this city, to see Miss E. W. She is 18 years of age, German parentage, fair complexion, plump and healthy, all the functions of the body normal.

Dr. Tomboeken, the attending physician, furnished me with the following history:—

“In the spring of 1874, I was called to treat Miss W. for a lumbar abscess. The mother informed me that the patient began to complain one year previously of general bad feeling, losing strength and flesh, the face and limbs beginning to bloat, for which she was attended by her physician. Later a painful swelling showed itself in the left lumbar region which was poulticed until suppuration took place, and the abscess pointing was opened. About one pint of thick offensive pus was discharged, mixed with shreds half an inch long of what seemed rotten flesh. The abscess continued to discharge freely, the patient growing weaker.

“Topical treatment only was employed; poultices and injections, for about five months, during which time she continued to grow worse, and at the end of which time I was called in. The patient at that time was 12 years of age, anæmic, œdematous, and small for her age, hectic, with poor appetite.

“Examination showed a fistulous opening $3\frac{1}{2}$ inches to the left of lumbar spine, and one inch above the crest of the ilium, and a second cicatrix 2 inches nearer the spine, the seat of the original opening. A probe could be introduced to the depth of $3\frac{1}{2}$ inches upward, inwards, and to the left, the point of the probe being, as near as I could judge, 2 inches deep in a direct line from the surface. The discharge from the opening was sero-purulent, amounting to two or three ounces daily.

“I addressed my treatment mainly to the general health of my patient, giving stimulants, tonics, cod-liver oil, and nutrients, and opening the fistula up, shortening it one inch, I directed stimulating injections into it.

“This was continued eighteen months; at the end of which time my patient's general health was greatly improved, the discharge had diminished to two drachms per diem, but still showed no disposition to close. I would say here that there was not during my attendance or previously any pain, swelling, or soreness pointing toward the spine as the seat of the trouble.

“During an absence in Europe of several months, the patient was left in the hands of another physician, who made vigorous endeavours to heal the fistulous opening without success. Upon my return to the city, I found my patient in seemingly perfect general health, the fistula about the same as it had been for the last four years. Meantime the girl of 12 had grown to be a young lady, and the annoyance of the discharge, with my urgent solicitations, at last had the effect of gaining the consent of her parents to a surgical operation for her relief. With this object I called in Dr. R. L. Rea.”

Examination revealed a fistulous opening two inches above the crest of the ilium, $3\frac{1}{2}$ inches from the spine, a probe could be passed obliquely upwards and inwards about 2 inches penetrating towards the centre of the body. Discharge sero-purulent, about one teaspoonful daily, very slight induration felt in the line of the fistula. It was determined to make an explorative operation, which was consented to by parents, to ascertain the cause of the discharge, feeling that there was some local cause if it could be reached.

On Nov. 22, the patient being thoroughly anæsthetized by Dr. Tomboeken, I introduced a director into the sinus, and after making a free cutaneous incision followed the director, and detected a circumscribed callosity at the end of the canal, and upon opening it found it to be a sac from which I removed a calculus more than half an inch long (14 mm.), three-eighths of an inch (9 mm.) in diameter, rough mulberry shaped, con-

taining a smooth oval cavity, opening at one end. The position of this calculus in the body was midway on a line dropped vertically from a point $2\frac{1}{2}$ inches behind the anterior extremity of the last rib down to the crest of the ilium, $2\frac{1}{4}$ inches from the surface, near the anterior surface of the quadratus lumborum muscle.

Dr. Tomboeken analyzed a portion of the calculus, and found it to consist of oxalate of lime. How came it there? My impression, seconded by that of Dr. T., was that a calculus had formed in the pelvis of the kidney, its unusual size obstructing the ureter, inflammation set in, an abscess formed, the calculus was carried towards the surface of the body, detained, and was finally encysted as we found it. The nucleus of the stone was undoubtedly some of the more soluble elements that enter into calculous formations, which were exposed to the soluble action of the fluids, and were dissolved and passed off in the pus.

The wound was filled with carbolized lint, after stimulating the bottom of it with nitrate of silver; 10 grains of sulphate of quinia were administered every 12 hours for three days; and now, at the end of two weeks, the patient is in excellent condition, wound healing, and every prospect of a complete recovery.

Feb. 11, Dr. Tomboeken reports the wound healed and patient discharged on *Feb. 5* in perfect health.

The case is one of unusual interest, as showing Nature's possibilities.

ARTICLE XIII.

STATISTICS OF AMPUTATIONS PERFORMED AT ST. FRANCIS HOSPITAL, JERSEY CITY, N. J., FROM 1871 TO 1881. By THEODORE R. VARICK, M.D., Medical Director of, and Surgeon to St. Francis Hospital, Surgeon to Jersey City Charity Hospital, Jersey City, New Jersey.

THE value and interest which attach to statistics relating to amputations, are evidenced by the able reports of Norris and Morton of Philadelphia, Hayward of Boston, Buel of New York, Callender and Phillips of England, and numerous others in this country as well as in Europe. I shall, therefore, offer no apology for presenting to the Profession the results of nearly ten years' service in St. Francis Hospital, Jersey City, viz., from July, 1871 (the time of the organization of the Hospital Staff), to January 1st, 1881.

Situated as Jersey City is, being the terminus of no less than eight lines of railroad, with their various connections, all converging to a point within an area of about one mile, together with their many shops and drill yards; it is not surprising that many injuries resulting therefrom are admitted to our hospitals.

The great preponderance of accidents from the sources alluded to will be seen by a perusal of the following statistics:—

No.	Admission.	Name.	Age	Disease or injury.	Part amputated.	Immediate or otherwise.	Result.	Period of discharge, or death.
1	1871. July 27	Patrick O'Neill,	26	C. c. fract. leg, railroad accident,	Thigh, lower 3d,	Immediate,	Cured,	Nov. 27, 1871
2	Sept. 24	Ed. Ferguson,	24	C. c. fract. leg, railroad accident,	" " "	"	Died,	Oct. 30, 1871
3	Dec. 8	Mich. Hartwater,	20	C. c. fract. foot,	Syme's,	"	Cured,	Jan. 14, 1872
4	1872. Jan. 8	Morris Harely,	30	C. c. fract. thigh, railroad accident,	Thigh, middle 3d,	Immediate,	Died,	Jan. 10, 1872
5	Feb. 9	Thomas Green,	30	C. c. fract. thigh,	" " "	"	"	Feb. 13, 1872
6	March 8	Luke McGuire,	45	C. c. fract. thigh,	" " "	"	Cured,	April 3, 1872
7	April 17	Charles Lester,	24	C. c. fract. thigh,	" " "	"	"	May 11, 1872
8	" 19	Pat. Ginnivan,	27	C. c. fract. thigh,	" " "	"	"	Aug. 31, 1872
9	June 17	Joseph Sweeney,	21	C. c. fract. foot,	Pirogoff,	"	"	Oct. 9, 1872
10	Aug. 5	Ed. King,	32	C. c. fract. arm,	Arm,	"	Died,	Aug. 9, 1872
11	Nov. 4	Samuel Meade,	12	C. c. fract. leg,	Thigh, lower 3d,	"	Cured,	Jan. 10, 1873
12	Dec. 14	Joseph Fisher,	13	C. c. fract. leg,	" " "	"	"	May 30, 1872
13	1873. Jan. 21	Jere Sullivan,	40	Caries knee-joint,	Thigh,	.....	Cured,	Feb. 25, 1873
14	" 29	James Hession,	26	C. c. fract. thigh, railroad accident,	Thigh, middle 3d,	Immediate,	"	" 20, 1873
15	Feb. 13	David S. Scofield,	36	C. c. fract. hand,	Arm,	.....	Died,	"
16	April 19	John Sherman,	27	C. c. fract. foot,	Leg, middle 3d,	.....	"	April 30, 1873
17	May 12	Jose Lopez,	27	C. c. fract. thigh,	Thigh, middle 3d,	.....	"	May 16, 1873
18	" 23	Pat. Connolly,	32	C. c. fract. both thighs, railroad accid't,	Thigh, l. mid. 3d,	Immediate,	"	June 2, 1873
19	" 30	Thos. Terwillager,	23	C. c. fract. thigh, railroad accident,	Thigh, middle 3d,	"	Cured,	July 18, 1873
20	Aug. 1	Mich. Garey,	60	No record,	Arm,	.....	Died,	Aug. 16, 1873
21	" 5	James Moran,	15	C. c. fract. leg, railroad accident,	Leg,	.....	"	Sept. 2, 1873
22	" 26	Thomas McCoffen,	32	C. c. fract. arm,	Arm,	Immediate,	"	Sept. 9, 1873
23	Sept. 13	John Day,	28	C. fract. arm,	" " "	"	"	Sept. 9, 1873
24	" 13	James Kilroy,	28	C. c. fract. leg,	Leg,	"	"	Oct. 9, 1873
25	Dec. 2	William Murray,	17	Caries condyles femur,	Thigh, lower 3d,	.....	"	Dec. 24, 1873
26	" 7	John Connors,	35	Gangrene leg,	" " "	.....	"	" 22, 1873
27	1874. May 14	Francis Hopkins,	13	C. c. fract. metacarpus,	Forearm,	Immediate,	Cured,	June 9, 1874
28	" 15	Michael Duane,	45	.....	" " "	"	"	July 13, 1874
29	" 15	M. K. Lynch,	28	.....	" " "	"	"	" .....
30	June 7	And. Wannamacher,	16	C. c. fract. thigh, railroad accident,	Hip-joint,	"	Died,	June 9, 1874
31	" 9	Margaret Simpson,	47	Abscess knee-joint,	Thigh,	.....	"	" 22, 1874

No.	Admission.	Name.	Age	Disease or injury.	Part amputated.	Immediate or otherwise.	Result.	Period of discharge, or death.
32	June 21	James McCormick,	21	Lac. wound of hand,	Forearm,	Immediate,	Cured,	July 19, 1874
33	July 11	Fred. Everly,	26	.....	Arm,	.....	Died,	Aug. 13, 1874
34	" 15	Luke Boylan,	30	Lac. wound forearm,	Forearm,	Immediate,	Cured,	Oct. 8, 1874
35	Aug. 23	Pat. Logan,	23	Lac. wound forearm,	"	"	Died,	Aug. 26, 1874
36	" 29	Thomas Nevins,	30	Gangrene leg,	Leg,	.....	"	Sept. 28, 1874
37	Sept. 24	Andrew Scott,	20	C. c. fract. leg,	Thigh, lower 3d,	Immediate,	Cured,	Oct. 28, 1874
38	Oct. 3	James Ryan,	28	C. and l. wound of arm,	Arm,	"	Died,	Oct. 29, 1874
39	Nov. 3	Samuel Outcalt,	19	C. fract. forearm,	Forearm,	"	Cured,	Nov. 5, 1874
40	" 4	George Egerson,	48	.....	Foot,	.....	"	Dec. 6, 1874
41	" 14	Florence Simon,	22	C. fract. leg,	Knee-joint,	Immediate,	Died,	Nov. 15, 1874
42	Dec. 30	Michael Noonan,	46	C. c. fract. leg,	Leg,	"	"	Jan. 7, 1875
43	1875.							
43	Jan. 9	Charles Titsworth,	19	.....	Arm,	.....	Cured,	Feb. 5, 1875
44	Feb. 26	Robt. Brummegen,	60	C. fract. arm,	"	Immediate,	"	May 27, 1875
45	April 5	Alfred Herbert,	14	C. c. fract. leg, railroad accident,	Thigh,	"	Died,	April 10, 1875
46	" 6	John Abell,	50	Lac. wound of hand,	Forearm,	"	Cured,	Aug. 21, 1875
47	June 27	Susan Wishinski,	50	Cellulitis of leg (abscess),	Thigh, lower 3d,	.....	Died,	July 30, 1875
48	Aug. 30	Catherine O'Neill,	29	.....	Leg,	.....	Cured,	Jan. 9, 1876
49	Sept. 25	Pat. Gilligan,	27	C. c. fract. leg, railroad accident,	"	Immediate,	"	March 27, 1876
50	Dec. 18	John Connor,	52	Caries metacarpal bones,	Forearm,	.....	"	Feb. 8, 1876
51	1876.							
51	Jan. 8	James Moore,	17	C. c. fract. leg, railroad accident,	Knee-joint,	Immediate,	Died,	Jan. 30, 1876
52	April 13	James Quinn,	9	C. c. fract. leg,	Thigh, lower 3d,	"	"	April 15, 1876
53	" 22	William Mount,	23	C. c. fract. leg,	Knee-joint,	"	"	May 7, 1876
54	May 9	George Schanek,	23	C. c. fract. leg,	Thigh, lower 3d,	"	"	June 1, 1876
55	May 13	William Mahoney,	35	C. c. fract. metacarpus,	Forearm,	Immediate,	Cured,	July 6, 1876
56	Sept. 27	John Dynes,	54	C. c. fract. leg, railroad accident,	Thigh, lower 3d,	"	Died,	Nov. 19, 1876
57	Oct. 2	James Smith,	23	C. c. fract. leg,	"	"	"	Jan. 11, 1877
58	" 29	George Howe,	9	C. c. fract. leg,	"	"	"	Oct. 20, 1876
59	" 20	Pat. McCormick,	45	C. c. fract. humerus,	Shoulder-joint,	"	Cured,	Feb. 20, 1877
60	Nov. 4	George Gallagher,	12	C. c. fract. metatarsus,	Leg,	"	"	Nov. 29, 1876
61	" 16	William Lehman,	22	C. c. fract. leg, railroad accident,	"	"	"	Nov. 8, 1877
62	" 27	Ed. Brannagan,	24	C. c. fract. leg,	Thigh, lower 3d,	"	"	March 3, 1877
63	Dec. 14	Michael O'Neill,	28	Necrosis of tibia,	"	.....	"	" 3, 1877
64	" 20	John McFall,	22	C. and l. wound of hand,	Forearm,	Immediate,	Died,	June 11, 1877

No.	Admission.	Name.	Age	Disease or injury.	Part amputated.	Immediate or otherwise.	Result.	Period of discharge, or death.
65	1877. Jan. 22	Jesse Muller,	27	C. and l. wound of arm,	Shoulder-joint,	Immediate,	Died,	Feb. 16, 1877
66	" 6	Andrew Rabbitt,	35	Fract. olecranon, wound forearm,	Arm,	"	Cured,	April 26, 1877
67	" 9	John Nolan,	18	C. fract. tibia,	Thigh,	"	Died,	March 25, 1877
68	April 30	Rachel Reill,	31	C. c. fract. leg and thigh, railroad accident,	Hip-joint,	"	"	April 30, 1877
69	May 12	M. G. Kelly,	25	C. c. fract. forearm,	Arm,	"	Cured,	June 10, 1877
70	" 17	William Reach,	25	C. fract. foot, railroad accident,	Leg,	"	"	" 27, 1877
71	July 19	Tim. Creedin,	50	C. fract. thigh and leg, railroad accident,	Thigh, middle 3d,	"	"	Oct. 4, 1877
72	Aug. 15	M. Dembinsky,	40	C. fract. metatarsus,	Pirogoff's,	"	"	Feb. 1, 1878
73	" 28	Pat. Good,	11	C. and l. wound foot,	"	"	"	Nov. 8, 1877
74	Sept. 18	James Buck,	25	C. c. fract. metacarpus,	Forearm,	"	"	Oct. 22, 1877
75	1878. Jan. 15	John Reegan,	18	Necrosis of tibia,	Leg,	.....	Died,	Feb. 19, 1878
76	Feb. 22	Herman Polster,	29	Erosion cartilages ankle-joint,	"	.....	Cured,	June 3, 1878
77	March 1	Peter Henderson,	55	C. c. fract. leg and foot, railroad accid.	Thigh, lower 3d,	Immediate,	"	May 2, 1878
78	" 21	Thomas Collins,	17	C. c. fract. leg, railroad accident,	"	"	"	Aug. 10, 1878
79	July 9	Wilhelmina Reim,	32	Chronic arthritis knee-joint,	"	.....	"	Sept. 23, 1878
80	Aug. 13	James Murphy,	35	C. c. fract. leg, railroad accident,	"	Immediate,	"	Oct. 27, 1878
81	" 21	James Blancy,	60	C. and l. wound wrist-joint,	Forearm,	"	"	Oct. 26, 1878
82	Oct. 24	Paul Commerford,	22	C. and l. wound foot, railroad accident,	Leg,	"	"	Dec. 15, 1878
83	Nov. 8	John Shelly,	38	C. c. fract. forearm,	Forearm,	"	"	" 1, 1878
84	" 12	Thomas Smith,	26	C. fract. metatarsus,	Leg,	"	"	" 15, 1878
85	Dec. 23	Tim. Lynch,	23	C. fract. forearm,	Arm,	"	"	Jan. 25, 1879
86	1879. Jan. 16	Cyrus Boyce,	29	C. c. fract. arm,	Arm,	Immediate,	"	Feb. 22, 1879
87	" 30	Thomas Connell,	21	C. c. fract. thigh, railroad accident,	Thigh, middle 3d,	"	Died,	Jan. 31, 1879
88	May 2	Charles McDonald,	45	Erosion cartilages ankle-joint,	Leg,	.....	"	June 12, 1879
89	July 3	Mich. Maloney,	36	C. c. fract. leg, railroad accident,	Thigh, lower 3d,	Immediat,	Cured,	Aug. 14, 1879
90	Aug. 12	Mark Fallon,	15	Lac. wound of knee,	"	.....	"	Jan. 30, 1880
91	Oct. 31	David Sharratt,	33	C. and l. wound of arm,	Shoulder-joint,	Immediate,	Died,	Nov. 11, 1879
92	1880. Feb. 2	Wm. Coughlin,	22	C. c. fract. leg, railroad accident,	Thigh, lower 3d,	"	"	March 5, 1880
93	March 9	Wm. Bratton,	23	C. fract. arm,	Arm,	"	Cured,	April 18, 1880
94	Sept. 6	James Leary,	30	C. fract. elbow-joint,	"	"	"	Dec. 18, 1880
95	Oct. 23	John Riley,	35	C. c. fract. leg, railroad accident,	Thigh, lower 3d,	"	Died,	" 18, 1880

Summary.

	Cases.	Cured.	Died.
Immediate operation	75	44	31
Secondary operation	20	9	11
	95	53	42
Amputation.			
Thigh	38	19	19
Leg	15	8	7
Arm	15	8	7
Forearm	14	12	2
Knee-joint	3	...	3
Shoulder-joint	3	1	2
Pirogoff's	3	3	...
Syme's	1	1	...
Hip-joint	2	...	2
Foot	1	1	...
	95	53	42

Treatment.—Prior to December, 1876, the treatment was by closing the stump by means of sutures and adhesive straps, and light external dressing of lint or oakum, confined with a bandage of sufficient firmness to prevent muscular twitching and retain the dressing.

Up to this period there occurred 62 cases, of which 30 recovered and 32 died, viz.:—

Amputation.	Cases.	Cured.	Died.
Thigh	26	11	15
Syme's	1	1	...
Pirogoff's	1	1	...
Arm	9	2	7
Leg	9	4	5
Forearm	10	9	1
Hip-joint	1	...	1
Foot	1	1	...
Knee-joint	3	...	3
Shoulder-joint	1	1	...
	62	30	32

Since that time a change has taken place in the management of the stump; and the *open* substituted for the *closed* method, and the use of antiseptics: viz., Listerism, thymol, potass. permanganate, and acid. carbolic. in solution, or combined with vaseline, has been resorted to, and with the most gratifying results.

From the period last named up to this date (January, 1881) there occurred 33 cases, of which 23 were cured and 10 died, viz.:—

Amputation.	Cases.	Cured.	Died.
Thigh	12	8	4
Forearm	4	3	1
Arm	6	6	...
Hip-joint	1	...	1
Shoulder-joint	2	...	2
Leg	6	4	2
Pirogoff's	2	2	...
	33	23	10

Twenty-one of these were treated by the *open* method, of which 15 were cured and 6 died: viz., hip-joint 1, thigh 10, leg 5, arm 3, forearm 2; total 21.

The antiseptics used in these cases were as follows:—

	Cases.	Cured.	Died.
Potass. permanganate	6	4	2
Carbolic acid	5	3	2
Thymol	8	7	1
No antiseptic	2	1	1
	21	15	6
Lister's method	6	5	1

viz.: thigh 2, leg 1, arm 2, forearm 1; total 6.

To these may be added one amputation of the forearm, performed a few days before the close of the year. The patient is still under treatment.

I am aware that the number of cases is too limited to establish definitely the comparative merits of the two systems of treatment (open and Lister's); but I furnish the facts for what they are worth, in the hope that future investigation may perfect a system of treatment which shall obviate to the greatest degree the evil consequences often following major amputations.

The ages of those operated on were as follows:—

	Cases.	Cured.	Died.
Under 10	2	...	2
Between 10 and 20	16	9	7
“ 20 “ 30	40	25	15
“ 30 “ 40	18	8	10
“ 40 “ 50	10	6	4
“ 50 “ 60	6	4	2
“ 60 “ 70	3	1	2
	95	53	42

Of the 95 cases reported, 47 were traumatisms, the result of railroad accidents.

In those of the lower extremity, the limb as a rule was crushed by passing trains, and a large majority of those of the upper extremity by the coupling of cars.

The gravity of the first-named class of injuries will be seen by a reference to the preceding table.

In addition to the suddenness and violence of the shock, and the apparent crushing and laceration of the parts, the injury to the soft tissues often far exceeds what is manifest to the eye, although the integument may to all appearance be sound and free from injury.

A recognition of these facts has led to the practice, in amputations, of giving the seat of injury "*a wide berth*," especially as relates to the lower extremity.

In those cases where the injury extends above the lower third of the leg, the rule is to amputate above the knee.

This may seem somewhat heretical, but the pulpification of the muscular tissue, the presence of coagula underlying the deep-seated muscles, and as I have frequently seen them extending from the seat of injury to the popliteal space, and the inevitable sequence of sloughing and extensive suppuration of the parts, too often followed in turn by septicæmia and pyæmia, are sufficient arguments, to my mind, to put a large joint between the point of operation and seat of injury.

The practice of the hospital has been eminently conservative, and amputation only resorted to when it became manifest that the limb was hopelessly injured.

In open stumps there sometimes exists, especially in muscular subjects, a strong tendency to retraction of the flaps. This is to be counteracted by the application of extension after Buck's method in cases of fracture of the thigh. The straps are to be applied on the anterior and posterior aspects of the limb, and are further utilized as granulation progresses, by pinning the two together, thereby approximating the flaps. By this method the dressing may be renewed, and the wound thoroughly cleansed without any inconvenience to the patient.

During the period embraced in this report, no accident has occurred from the use of anæsthetics: Ether, and Bader's formula, viz., alcohol 1 part, chloroform 2 parts, ether 3 parts, being the anæsthetics employed.

ARTICLE XIV.

INTESTINAL HEMORRHAGE AND ITS PROGNOSTIC SIGNIFICANCE IN TYPHOID FEVER. By M. B. HARTZELL, M.D., of Philadelphia.

AMONG the many accidents which may occur during the course of typhoid fever, intestinal hemorrhage is not very unusual. According to Bamberger, typhoid fever is, after dysentery, the most frequent cause of hemorrhage from the bowels.

Induced by the great diversity of opinion among authors concerning this complication, I have carefully analyzed a considerable number of cases with regard to the various circumstances under which it may occur; and more especially as to the influence which it exerts upon the prognosis, as this is the point upon which authorities differ most widely.

The hemorrhage may take place from the capillaries of the intestine without rupture of their walls, or it may proceed from an eroded vessel traversing the ulcers which constitute one of the pathologico-anatomical features of typhoid. It most likely happens in the first-mentioned way when it occurs at an early period in the disease, as the ulcerations have not then advanced far enough to produce a solution of continuity in the arteries supplying the intestinal mucous membrane. That large hemorrhage may occur without a rupture of the vessels is strikingly illustrated by a case reported by Markwald, in which a profuse intestinal hemorrhage occurred during the course of an attack of typhoid fever; at the post-mortem examination ulcerations were found, but upon injecting the vessels of the intestine with coloured fluid not a drop escaped to indicate the presence of a rupture.

In 5164 cases of typhoid fever which I have collected from various sources, intestinal bleeding happened 331 times, or in 6.4 per cent.; this corresponds very nearly with the percentage given by late writers; Liebermeister¹ puts the frequency of its occurrence at 7.3 per cent.; Griesinger at 5.3 per cent.

As to the time of its appearance it is most apt to happen during the second and third weeks of the attack. Of 187 cases examined with regard to the time of the hemorrhage, it was found to occur—

	11 times in the first week.
55	“ “ second “
61	“ “ third “
41	“ “ fourth “
15	“ “ fifth “

while 4 cases occurred at a still later period; 81.9 per cent. of the whole number occurring in the second and third weeks.

It is worthy of remark that constipation exists much more frequently in the cases complicated by hemorrhage than in those running their course unaccompanied by this complication. In 60 cases noted by Murchison,² constipation existed 8 times; while in 89 cases which I have collected, this symptom was present 15 times, or in 16.8 per cent. It is very probable that the masses of hardened feces, by the pressure which they must exert upon the bowel in their passage through it, irritate the ulcerated mucous membrane and thus favour the occurrence of bleeding; this would in part explain the connection which seems to exist between these two symptoms.

¹ Ziemssen's Cyclopædia, vol. i. p. 147.

² Continued Fevers.

Sex seems to have no effect upon the frequency of the occurrence of the hemorrhage; in 42 cases 23 were males, 19 females.

In children typhoid fever is accompanied very infrequently by this complication; in 264 cases, occurring in children, hemorrhage was present but 5 times, or in 1.9 per cent., which is very much below the average frequency in adults.

The fact that there has been one hemorrhage makes it very probable that it will be repeated. In 11 out of 18 cases; or in 61 per cent., hemorrhage occurred several times; it is this repetition of the bleeding which is to be feared rather than an immediately fatal effect from a single hemorrhage.

While most authors, among them Louis, Jenner, Murchison, and Niemeyer, agree in attributing a grave significance to the appearance of enterorrhagia, such trustworthy observers as Stokes, Graves, Trousseau, and Flint, do not consider that it is of very grave import; indeed, according to Stokes,¹ "it may sometimes be regarded as to some extent a critical phenomenon, and it often produces a beneficial and curative effect, lessening the local determination and irritation," while Trousseau declares, "that hemorrhages in typhoid fever, so far from possessing the character of danger imputed to them, are usually of favourable augury."²

A careful examination of statistics, however, must lead to the conclusion that the presence of this complication influences the prognosis unfavourably. Opinions founded upon a limited number of cases cannot be taken as conclusive; it is only by examining a large number that we are enabled to arrive at a trustworthy conclusion.

In 60 cases of typhoid fever accompanied by hemorrhage, Murchison had 32 deaths, or 53.3 per cent.; but this is by no means to be taken as representing the gravity of this symptom, for 11 of these 32 died of peritonitis. Ragaine in 115 cases did not have a single death. It is very evident that any conclusion as to the fatality of intestinal hemorrhage, drawn from either of these two series, would be utterly worthless. In 127 cases Liebermeister found the mortality to be 38.6 per cent. Of 333 cases which I have analyzed there were one hundred and thirty-four deaths, or 40.2 per cent., which may be taken as fairly representing the mortality of this complication.

That astonishingly large quantities of blood may be lost without unfavourably influencing the course of the disease is known to every observer, and was well shown in a case of my own which I will here briefly sketch.

C. M., a locomotive fireman, 34 years of age, of robust frame and temperate habits, was taken ill with typhoid fever which quickly assumed a very unfavourable aspect; the temperature was continuously high, varying from 104.6° to 105°, with no morning remissions; there was active

¹ Lectures on Fever.

² Clinical Medicine, vol. 1.

delirium and subsultus; the bowels were obstinately constipated. On the evening of the ninth day there was a profuse hemorrhage, ascertained by subsequent measurement to amount to three pints; this was followed by all the symptoms of profound anæmia—almost complete extinction of the radial pulse, profuse perspiration, restlessness, nausea, etc.; the temperature rapidly declined, falling more than 4° in five hours; within the next forty-eight hours the temperature reached 105.6° , but, as was not the case before the hemorrhage, it was quickly reduced by the use of antipyretics—sodii salicylat. principally; indeed, the hemorrhage seemed to have favourably influenced the obstinate character of the fever, making it much more amenable to treatment. There was no repetition of the bleeding, and the case progressed toward recovery without any other noteworthy symptom except the obstinate constipation, which persisted throughout the attack.

Although a digression, I wish here, on account of its success, to call attention to the manner in which the sodium salicylate was administered in this case. Taking advantage of the fact that the normal tendency of fever is to decline during the night, the drug was given exclusively at this time. By adopting this method, giving from 120 to 160 grains between 6 P. M. and 6 A. M., a morning remission of three and a half to five degrees was always obtained, and the evening rise notably diminished. In order to test its effect more thoroughly, the salicylate was omitted at various times; upon these occasions there was either no morning remission at all, or but a slight one of one-half to one degree. I am well convinced that, unless there is some special contraindication, this is the proper method to be pursued when we wish to obtain as great a reduction of the fever as possible, for I have never been able to produce such great falls in temperature by giving the antipyretic continuously through the twenty-four hours.

A careful analysis of the cases examined leads to the conclusion that the hemorrhage, if not inordinately large nor repeated, does not materially affect the prognosis in robust subjects; but, as I have indicated above, the bleeding is repeated in the majority of cases; it is this tendency to recurrence that makes entorrhagia in typhoid fever a symptom of unfavourable omen.

Furthermore, from the large proportion of deaths from peritonitis in the sixty cases recorded by Murchison, it would appear that cases accompanied by hemorrhage are much more apt to suffer from perforation of the bowel, the chief cause of peritonitis in typhoid fever; not because of the bleeding, but because the ulcerative process is much more severe in such cases, especially in those suffering from the hemorrhage late in the disease when the bleeding proceeds from a ruptured vessel. However, the number of cases is too small to draw a positive conclusion from with regard to this point.

When the intestinal hemorrhage is accompanied by bleeding from the gums, genital organs, and into the subcutaneous tissue, it is a symptom of the most serious significance, indicating a speedily fatal termination; it is then due to a profound alteration of the walls of the capillaries and of the

blood itself; the hemorrhage from the bowels is then only one manifestation of a general hemorrhagic tendency, a complete disorganization of the blood.

To conclude, while in some instances a hemorrhage from the intestines may seem to ameliorate the condition of the patient, this is not the rule; but, on the contrary, this symptom is to be looked upon as decidedly unfavourable, for in typhoid fever the total mortality is about 18 per cent.; in cases complicated by hemorrhage it is over 40 per cent., thus proving conclusively the unfavourable character of the complication; and the contrary opinion held by the distinguished authors quoted is only to be explained upon the ground that it was based upon an insufficient number of cases.

ARTICLE XV.

AN UNDESCRIBED SOURCE OF DANGER IN OVARIOTOMY. By T. M. DRYSDALE, M.D., of Philadelphia.

N. A., an unmarried lady, thirty years of age, was sent to me by Dr. H. S. Lucas, of Chester, Mass., January 6, 1880. She was of medium size, rather emaciated and pale, but cheerful. She gave me the following history: Her general health had been uniformly good, but she had never been strong. Her father was living and in good health; her mother had recently died from cancer of the uterus.

She had first menstruated when twelve years old, with violent cramps and copious flow. She has suffered greatly at her periods ever since, the pain occurring after the commencement of the flow. She menstruates regularly, with a profuse discharge accompanied by clots. The flow lasts from four to nine days, and has not increased since she discovered the tumour.

Four years ago she first noticed a bloating of the whole abdomen. It seemed to protrude, from the first, at the centre, and did not start from either side. Two years since, while nursing a sick sister, she had been much on her feet, which had caused the swelling to increase rapidly and become very prominent. The abdomen has enlarged slowly ever since that time, projecting most in the centre near the umbilicus.

She had consulted many physicians who had agreed in considering her disease as ascites. Dr. Lucas, however, on examining her had pronounced it ovarian dropsy. She had taken great quantities of medicine, such as elaterium, etc., which had injured her general health.

I found the abdomen occupied by a soft, movable, elastic tumour with smooth walls, which reached as high as three inches above the umbilicus. It was dull on percussion and vibrated, but did not fluctuate distinctly. The abdomen above the tumour was resonant on percussion, and there was resonance along the right border of the mass, but along the left it was dull.

The upper part of the pelvis was occupied by the tumour, which pushed the uterus downwards and to the right. The uterine sound entered four inches, and when inserted was not much affected by motion given the

tumour. I diagnosed a unilocular ovarian cyst, and confirmed the diagnosis by emptying the cyst completely by means of the aspirator, obtaining a gallon of fluid resembling thin boiled starch in colour and general appearance. This fluid became more opaque when boiled, but no coagulum was formed. Examination by the microscope showed ovarian cells present in great abundance.

The patient had to leave the city unexpectedly, thirty hours after the aspiration, and make the long and fatiguing journey to her home, but no unpleasant result followed the effort. As soon as she was certain that she had an ovarian tumour she became urgent to have it removed at once, although I advised her to wait until the cyst filled again. For certain reasons she would not consent to the delay.

Accompanied by my son, I visited her in Chester, Mass., and operated, January 28, in the presence of Dr. Hutchison, of Huntington, Drs. Fay and Fisk, of Chester, Dr. Stebbins, of Springfield, Dr. Paddock, of Pittsfield, Dr. Leroy McLean and Mr. H. O. R. Tucker, of Troy, New York. Drs. McLean and Paddock were my principal assistants, and Dr. Lucas gave the anæsthetic.

Under the carbolized spray, an incision about three inches in length was made, midway between the umbilicus and pubis, and carried directly down to the peritoneum. A vessel in the abdominal wall bled freely, but was secured by the hæmostatic forceps. On incising the peritoneum, the omentum presented itself at the wound, and on raising it a loop of intestine followed.

Passing two fingers downwards, I reached the cyst, which lay deep in the pelvis beneath the intestines, and drew it up and secured it by means of the cyst forceps. Finding it free from adhesions I attempted to draw it through the incision, but it was too large. A trocar was thrust into it, and as the fluid escaped the cyst-wall collapsed, and when a sufficient quantity of fluid had been removed the tumour yielded to gentle traction, and came through the small wound without difficulty.

It proved to be a cyst of the left ovary. The pedicle, which was long, was secured by a clamp, and the wound completely closed around the pedicle with three metallic sutures. The usual antiseptic dressings were applied to the wound, and the whole secured by a flannel roller. The patient recovered without an unpleasant symptom, her pulse never reaching beyond eighty-five, nor her temperature beyond ninety-nine degrees.

Among the points of interest presented by this case, one is the absence of distinct fluctuation. Considering the character of the fluid, this was certainly unusual, and led to a doubt, in the minds of some physicians who had examined her, as to the nature of the disease.

The unusual difficulty met with in the operation, however, was the most interesting feature in the case. In performing ovariectomy, we generally find the abdomen occupied by a mass, which, by its presence, gives prominence to the abdominal wall and displaces the viscera which naturally occupy the front part of the abdominal cavity. An incision made through the abdominal wall and peritoneum, all treatises upon ovariectomy agree, brings us directly in contact with its white, pearly surface. But it was not so in this case. The urgency of the patient, having induced the removal of the cyst before it had time to become again distended with fluid,

created a difficulty which is unusual, and which is not alluded to in works on this subject.

In examining the abdomen just before operating I found it everywhere resonant, and could detect no tumour by the touch through the abdominal wall. The tumour had retreated into the pelvis. My incision, therefore, was carried directly down upon the intestines, and called for a greater amount of caution to avoid wounding them than is usually required in ovariectomy; for even after tapping, the adhesions, or the bulk of the cyst-wall, generally cause the tumour, at least partially, to retain its old position in the abdominal cavity, merely collapsing and diminishing in size.

This entire retreat of the tumour into the pelvis is, therefore, unusual, and can only occur when the cyst has been thoroughly emptied, is of moderate size, or has a very thin wall free from adhesions.

To an experienced and careful surgeon this complication may seem unimportant. To a novice, however, in the operation, who is necessarily guided mainly by what he has read upon the subject, and will, therefore, expect to see the tumour as soon as the abdominal wall is divided, the knowledge that such a complication may be met with is of great value. It may save the risk of wounding the intestines, and the embarrassment of seeking for a tumour which, before tapping, had distended the abdomen, and was only to be found, after a prolonged search, hid in the pelvis.

ARTICLE XVI.

A CASE OF NEUROPATHIC PARALYSIS OF THE ABDUCTOR MUSCLES OF THE GLOTTIS, OCCURRING DURING CHILDHOOD. TRACHEOTOMY TUBE WORN FOR THIRTY-TWO YEARS. DR. HORACE GREEN'S EXPERIMENTS. REMARKS. By GEORGE M. LEFFERTS, M.D., Clinical Professor of Laryngoscopy and Diseases of the Throat in the College of Physicians and Surgeons, N. Y.; Consulting Laryngoscopic Surgeon to St. Luke's Hospital, New York, etc.

I HAVE recently had under my care a case which presented so many interesting features, some hardly reconcilable with our present ideas concerning certain pathological conditions of the larynx, others which overthrow important conclusions promulgated in the past, and adopted as facts, and some which are, to me at least, new, that I judge it to be of sufficient clinical value to communicate to others.

An intelligent Irishwoman, of spare habit and nervous temperament, aged forty-four, consulted me as to the question of dispensing with the use of a tracheotomy tube, which she was wearing. Her clinical history dated back thirty-three years. At this time, she then being ten years of age, a heavy cold was contracted, evidently a severe attack of bronchitis and laryngitis, which was followed, ere she had fully recovered from its effects,

by the formation of two large indurated masses, with acute inflammatory symptoms, over the right side of the neck, in the neighbourhood of the sterno-cleido-mastoid muscle. They grew rapidly, and finally broke and discharged a large amount of sloughy material and tissue, leaving deep and extensive scars, which she still bears.

During the progress of the swellings (glandular) dyspnœa first manifested itself, and so progressively increased that, seven months later, the child's laboured and stridulous breathing attracted common attention, especially during the night, and finally became so urgent, the patient meanwhile losing flesh and strength, that tracheotomy was performed *in extremis* two months later, at the Brunswick Street Hospital, Dublin, under the care of Drs. Hutton and Adams.

Six months now elapsing, she was able to leave the Hospital, still, however, wearing the tube, which she was unable to dispense with, not being able to breathe when its opening was occluded by the finger. At the age of sixteen she emigrated to America, and two years later, her condition being unchanged, she came under the professional care of Dr. Horace Green.

The interest attaching to the case seems to have attracted his earnest attention, and the peculiar conditions existing at the time afforded an unusual opportunity, of which he, with his well-known zeal, was not slow to avail himself, of verifying certain investigations and conclusions, now matters of history, upon which he was then engaged and strongly advocating, as to the possibility of passing an instrument between and below the vocal cords. I find in one of his earlier essays, among "a series of proofs, that cannot be set aside, to establish most conclusively the positive performance of this operation," the following reference to this case, which I give in his own words:—

"I have had recently under my care, a young woman upon whom the operation of tracheotomy was performed several years ago. An opening into the trachea, just above the top of the sternum, has remained ever since. But the opening being quite small, and passing obliquely into the trachea, it is impossible to see into this tube. This patient was under my care for chronic pharyngo-laryngeal inflammation, for which she was successfully treated by topical medication.

"As this appeared to be an excellent case to prove the practicability of the operation in question, for the patient breathed much of the time through the larynx, I determined to make the attempt to pass the sponge-probang through the trachea to the opening.

"To prove its presence at this point (for it could not be seen through the small, oblique opening) my assistant, Dr. Richards, took a small wire of German silver, and passing the bent wire into the opening, sufficient to have it just penetrate into the trachea, retained it there, while I passed the sponge probang, wet with the nitrate of silver solution, quickly down the trachea upon the bent wire. The meeting of the sponge with the wire was plainly felt, and, on withdrawing the latter, it was blackened by its contact with the caustic. This operation was repeated a number of times in the presence of several physicians, and with the same result."

This account corresponds, in all its details, with the story of the patient, who adds that the sponge probang, which at first could not be passed, owing to the severe laryngeal spasm that it caused, and only succeeding after many trials and persistent training, was felt, judging from her sensations, just at the point indicated by the doctor. In just how far these

sensations were reliable, will appear in a moment. During the past twenty-six years, that is, since her arrival in this country, she has entirely dispensed with the use of the tracheotomy tube on several occasions, and for periods varying from one day to, on one occasion, over two weeks, but in each instance has become frightened, perhaps needlessly, at the embarrassment in respiration, and has replaced it. For months at a time, she has worn a plug in the tube during the day, and suffered no inconvenience, except when excited or undergoing unusual exertion, or when the desire for air became imperative, and necessitated its removal. Neither voice nor respiration, the tube being closed, have been or are such as to attract attention, and no examination of the larynx ever having been made, even since the date of the introduction of the laryngoscope into the diagnostic *armamentarium* (until my own), the use of a tracheal tube has, on more than one occasion, been deemed unnecessary, and a plastic operation proposed to close the wound in the trachea, but always declined by the patient, who, notwithstanding her desire to rid herself of it, had often learned from experience its necessity, and refused to submit to the theoretical *dictum* of the doctors in the matter.

Of late years she has passed from medical notice; has worn her tube uncomplainingly and constantly, gradually reducing its size, as the contraction of the cicatrized edges of the wound demanded, and led an active and even laborious life, until she came to me, asking the question with which this history opens.

My first impulse as the patient sat before me, breathing and speaking quietly, her hand and finger raised to her neck, as she closed the opening of the small tube, alone showing me that she wore one, was to agree with those who had recommended its removal. A glance at the condition of the larynx as revealed in the laryngoscopic mirror, however, proved its utility and permanent necessity. In an otherwise perfectly normal larynx, all proper physiological movement of the vocal cords was in abeyance, for, fixed and immovable in the median line of the larynx, a narrow chink alone representing the *rima glottidis* remained between them and was unaltered by inspiratory effort; the vocal cords at this time flattening somewhat, but not being abducted one from the other, in the slightest degree.

During phonatory effort adduction, as far as space permitted, took place, but feebly, and the column of air found its way through the narrow opening between the cords just alluded to, and threw their free edges into vibration in a manner, though not normal, yet sufficiently perfect to produce a clear voice of some force, but one, if its manner of production be closely studied, attended at times by forced expiration especially after prolonged speaking, giving it a somewhat spasmodic character. The tracheal wound is located at about the fourth to fifth ring, is small, surrounded by dense cicatricial tissue, and passes obliquely to the left into the trachea. The surrounding parts have been displaced by cicatricial contraction. The silver tube which she now wears is the size of the smallest of the series of hard rubber tubes (7 mm.), is single, and not more than one inch in length, slightly curved; it does not, therefore, reach more than a short distance into the trachea.

The other physical conditions have been alluded to elsewhere, and need not be repeated here.

My opinion, based upon a careful study and examination of the case, was that she must continue to wear the tube; that its use could not be dispensed with without danger, and that the laryngeal conditions were irre-

mediable. I have seen the case many times since my first examination, but have found no reason to change my views.

Remarks.—I have alluded to the case as possessing some unusual and peculiar features; among these I include the length of time that a tube has been worn, and this without local irritation or trouble to the patient; a fact which goes to refute some of the statements made by Petel, Carrié, Körte, and others, as to the dangers incurred by the prolonged presence of a tube within the trachea. Again, the excellent character of the voice is unusual; for, though experience has amply proven that, curiously enough the voice is but little affected in the disease under consideration, it is seldom that it presents such almost complete immunity from change as in this instance, the flow of speech being alone occasionally interrupted by a slightly stridulous inspiration. Still further, instead of “laboured, noisy, and difficult inspiration with frequent urgent dyspnœa,” and “great stridor in sleep”—the characteristic symptoms of the disease—our patient goes calmly about with her tube closed, even dispenses with it for a time, and thus refutes both theory and common experience by fact.

As to the nature of the primary lesion and its *modus operandi* in producing the laryngeal conditions heretofore described, I think there can be no doubt. I explain the sequence of events thus: the deep-seated glandular inflammation with subsequent sloughing, which she describes as occurring during her childhood, and of which she still bears the marks, implicated directly the right recurrent laryngeal nerve which lay within its area, and possibly the pneumogastric likewise, thus causing paralysis of the right lateral crico-arytenoid muscle, through involvement of certain fibres of the former nerve supplying this muscle, as is primarily the rule when the nerve trunk is but partially implicated, this assertion being based upon the well-known fact that the conducting function of a nerve is partially or entirely destroyed by pressure, even though this pressure be not followed by atrophy or destruction of the nerve substance.

Paralysis of one muscle being thus directly established, the involvement of its fellow upon the opposite side of the larynx, followed by reflex action or paralysis, as suggested as possible by Johnston, and exemplified in his published case, as well as in those of Bäumlér and Cohen, proves, as well as these cases, that a bilateral paralysis of the vocal cords may exist with pressure upon one side only. Such cases, it is true, are infrequent, but these here alluded to are sufficient to sustain my point.

The condition of the larynx thus produced in childhood, the period being corroborated by the facts of her clinical history, has continued unchanged throughout years, and exists to-day. If my view of its causation, its date, and my diagnosis of the fact of the laryngeal paralysis existing as described be accepted as true, the interesting question then arises, did Dr. Green ever pass a sponge probang between this woman's vocal cords? if not, one of the best and strongest, apparently one of the most convinc-

ing of the examples brought forward by him in support of his assertions, falls to the ground valueless. I maintain that it was physically impossible to do so in this case, for, aside from the difficulty, well known to all laryngoscopic experts, of passing *any* instrument, even the most delicate, between and below the vocal cords, even with the immense aid afforded by the use of the laryngoscope, an assistance which Dr. Green did not possess, the paralyzed vocal cords fixed in the median line formed here an impassable and elastic barrier which was only rendered still more resistant by direct pressure. But the patient tells us that she felt the sponge in the trachea. Are her sensations reliable? To satisfy myself and to answer this question I performed the following two experiments, after obtaining her permission to do so: I passed a small laryngeal brush (much smaller and by far less clumsy than the old-fashioned sponge probang) into her larynx, guided by its reflection in the laryngeal mirror, so that there was no question as to its entrance into that cavity. At first, firmly grasped by the contraction of the laryngeal walls, the spasm finally gave way, and the brush passed onwards to the vocal cords, where it was firmly arrested, and the strongest pressure allowable failed to cause them to give way in the slightest degree before it. Spasm, choking, and retching following, it was withdrawn. On questioning the patient, she affirmed that the brush had passed into her windpipe, had gone as far as it ever had in Dr. Green's hands, and located the limit of its excursion at a point just above her tube. A second attempt after the lapse of half an hour brought forth the same results, the difficulty of introducing the brush, even with the guidance of the mirror, being greater on account of spasm, and, though greater pressure was exerted on this occasion, the barrier offered by the tightly closed vocal cords did not give way, and, though the brush in point of fact penetrated, pressing the elastic vocal cords before it, somewhat deeper than on the first occasion, the patient informed me that I had not gone as far down as in the first attempt. Her own testimony then, judging from these examples of it, can hardly be regarded as trustworthy. Finally, Dr. Green tells us that the wire introduced through the tracheal wound was discoloured by the silver nitrate, and that therefore the sponge charged with it must have touched it. But is it not possible that the soaked sponge when pressed tightly down upon the vocal cords, and pressed upon likewise by the contracted laryngeal walls, should discharge enough of its contents to pass between the cords and run down the tracheal walls until the wire probe was reached? It seems so to me, but I present the fact with the others that I have detailed for the consideration and judgment of those who with me may be interested in this unusual case.

ARTICLE XVII.

RESTORATION OF FUNCTION OF SIGHT IN AN EYE AMBYLOPIC FOR YEARS.

BOTH EYES EXHIBITING VARIOUS DISEASES OF THE EYE, WITH TREATMENT. By WILLIAM S. LITTLE, A.M., M.D., of Philadelphia.

It is rarely the opportunity is afforded of seeing in one patient such a variety of diseases of the eye as the following case exhibits. It presents two of the causes of divergent strabismus depending on the eye alone, the treatment for vitreous opacity in one eye, and an ulcer of the cornea in the other; and the benefit derived from the correction of optical defects existing, and from a tenotomy of the tendon of the external rectus of each eye. The eye upon which vision had depended became useless, and the other eye, which was amblyopic and had undergone the lesions of myopia for years, became the useful eye.

The treatment required therapeutical, surgical, and optical measures. The mechanics of the ocular muscles are also presented.

Mr. W., æt. 33, was seen Sept. 1879, suffering from an ulcer of the cornea of the left eye, and an amblyopic condition of the right eye, vision reduced to counting fingers at two or three feet with both eyes.

He was also annoyed with diplopia resulting from the condition existing. He was led about for fear of accident. General health poor. Myopia prevails in his family, and several members have a divergent strabismus dependent on it.

Further, his right eye has a divergent squint and has been useless since early childhood; his left eye is near-sighted, and he has been compelled to wear glasses since a boy. In Oct. 1863, while in the army, a powder-magazine exploded near him, rendering him unconscious for three days, no injury to external parts, sight and hearing affected for a few days, remained in hospital for three months; sight and hearing became as good as they were before the explosion. The external rectus of right eye was divided in 1873, with no permanent result, the vision of the eye being so defective; no correction was given to his optical defect. In July, 1879, eight weeks prior to consulting me, a solution of ammonia, F. F., accidentally got in the conjunctival sac of the left eye, the one upon which vision depended, setting up a severe kerato-conjunctivitis, and destroying a portion of the cornea to the inner and lower quadrant, penetrating to almost the middle of the thickness of the cornea. Zinc and lead-water were used; vision was reduced to perception of light in the eye, and with the chronic conditions in the right eye he was reduced to almost blindness for a time. While the left eye was suffering from the acute conditions, he observed in a few weeks that he could begin to perceive objects with the right eye, and it gradually improved; the left eye still remained very irritable, and assumed the condition of ulcer of the cornea. With the return of function of sight to the right eye he was annoyed with diplopia, and when the left eye was closed he could not depend on the right eye.

On examination, the right eye presented a wide divergent squint, no ability to turn it inwards; to see directly in front he had to turn his head to

the left. Ophthalmoscope showed a myopia of one-fifth with myopic astigmatism; a posterior staphyloma, the disc, and staphyloma had the appearance of a double disc overlapping slightly and reaching toward the fovea. A large vitreous opacity also existed towards nasal side; the loss of field of vision corresponded principally to the opacity: when it passed before the fovea he was rendered momentarily blind; it presented the lesions found so frequently with uncorrected myopia. The left eye presented a loss of substance of the cornea at the lower and inner quadrant with ragged ulcerative edges, bloodvessels running into it from the conjunctiva; general opacity existed over the whole cornea, no iritis had occurred; the lachrymal sac had also been invaded with the solution of ammonia. There was profuse lachrymation, pain, and photophobia.

The treatment began by correcting the optical defect for the right eye, as, by forced use, it had commenced to perform its function — $V = \frac{2}{C}$. I

ordered a — 5C — 24cyl ax 45° $V = \frac{15}{XL}$.

The eye was to be treated with atropia, and for the vitreous opacity, I gave internally potassium iodid. and hydrarg. bichlor.

For the left eye I ordered hot water applications and atropia, and an ointment of yellow oxide of mercury. As vision improved the diplopia became more annoying; on Oct. 13, I divided the tendon of the external rectus of the right eye.

Oct. 15. Right eye in position $V = \frac{15}{XXX}$; vitreous opacity smaller; the

fog, he said, seemed to be disappearing, and was not so constant.

22d. Left eye with a — 8 $V = \frac{15}{LXX}$.

25th. Used eserine for left eye, instead of atropia.

Nov. 1. R E, $V = \frac{15}{XXX}$; L E, $V = \frac{15}{L}$.

As vision improved in each eye, he using the right principally, the left began to deviate to the outer canthus.

Jan. 26, 1880. R E, $V = \frac{15}{XV}$; L E, $V = \frac{15}{XXX}$; pupil dilated.

The cornea had filled up considerably, and what opacity was present was largely due to the lead that was used while the epithelium of the cornea was denuded.

Right eye showed few shreds of vitreous opacity, not so migratory, and not annoying.

He walks alone, reads and writes with right eye. It was interesting to watch the progress of restoration of function of sight in the right eye; he said he had to learn all over again to judge of place, distance, and relation of objects to each other with the right eye; and finally, he was able to shave, which was the most difficult thing for him to learn. It was as difficult for him to train the right eye as it would have been if he had lost a right hand, and had to train a left one to do the work.

March 26. R E, $V = \frac{15}{XV}$; L E, $V = \frac{15}{XXX}$; treated continually.

April 9, 1880. While holding the eye clinic at the Jefferson Medical College Hospital, during the spring and summer course, I divided the tendon of the external rectus of the left eye to remove the divergence that

followed as the result of the opaque cornea with the myopia existing. The result was satisfactory; with a dilated pupil he can control objects singly.

Oct. 1880. I find patient in a good condition, able to attend to work, but depending on his right eye for full and effective vision; he is able to control single vision by an effort, but has slight diplopia at times; with a dilated pupil of the left eye, so as to avoid the opacity, it then disappears.

The cause of the divergence of the right eye was due to the myopia, that of the left to the opacity of the cornea, along with the existing myopia. The vitreous opacity in the right eye may have had some influence on the divergence of the eye; but the divergence, no doubt, antedated the opacity.

No. 219 SOUTH SEVENTEENTH STREET, Oct. 8, 1880.

ARTICLE XVIII.

CONSECUTIVE LIGATION OF THE COMMON CAROTID AND SUBCLAVIAN ARTERIES FOR SUPPOSED ANEURISM OF THE INNOMINATE. AUTOPSY THREE YEARS AFTER THE LAST OPERATION. By LEWIS A. STIMSON, M.D., Surgeon to the Presbyterian and Bellevue Hospitals, New York.

IN the Wood Museum, Bellevue Hospital, New York, is a preparation made from the body of a man whose right common carotid and subclavian arteries had been tied, the one four years, the other more than three years, before his death. The preparation was made with the special object of showing the collateral circulation, and as such is believed to be unique of its kind. The dissection was not carried far enough to clearly show the condition of the aorta and innominate, and Prof. Wood, while appreciating fully the importance of a knowledge of the condition of those vessels, feared that any attempt to ascertain it after the preparation had become dry might break the injected arterial branches. Quite recently, however, he has directed a more complete dissection to be made, and, as autopsies made months or years after operations of this kind are few in number and important to the formation of a correct opinion concerning the value of the operation, I desire to place this one upon record. The case is one referred to in an article by myself on "Simultaneous ligation of the carotid and subclavian arteries," published in the *American Journal of the Medical Sciences*, July, 1880, note on page 68, and is no. xxv. in Dr. Wyeth's list of "Cases of distal ligature for aneurism near the heart," published in the same journal, January, 1881.

The patient, Peter M., 48 years of age at the time of his death, noticed in Oct. 1875, a small lump in his neck above the inner end of the right clavicle; it increased within a week to the size of a hickory-nut, and Nov. 1, 1875, the carotid was tied by Dr. Doughty at the Homœopathic Hospital. A copy of a description of the operation, furnished by Dr. D., forms part of the record of the case made during the patient's subsequent stay in

Bellevue Hospital. The vessel was reached by a V-shaped incision and free division of the lower attachments of the sterno-cleido-mastoid. Dr. D. says: "The innominate did not bifurcate till high up, so that the subclavian was nearly opposite the cricoid cartilage. The carotid was bent as though pushed up from below (S). The innominate and subclavian were somewhat enlarged and appeared diseased, the carotid less so. The tumour was formed by the subclavian at its origin. Below that the diseased condition of the subclavian and innominate counter-indicated the application of the ligature. I simply tied with little hope the common carotid. The patient made a good recovery from the operation, but with no improvement in the aneurism. He was then put upon tannic acid, gr. 60, a day, for two months more. On its discontinuance the tumour began to decrease in size, and he was finally discharged, as I was told, with no visible pulsation."

The following summer he was admitted to Bellevue Hospital, 4th Surg. Div. The record reads: "The tumour now is the size of a hickory-nut and situated about an inch behind the anterior margin of the sterno-mastoid muscle, and the same distance above the clavicle. It is fusiform in shape, pulsates strongly, but conveys no bruit. The subclavian was tied [in its 3d portion] by Dr. Mott, Aug. 17, 1876, when the pulsation of the aneurism became somewhat diminished, as well as its size. Sept. 13th, ligature removed this morning, 27th day. The aneurism does not show any special change in size or pulsation." Pulsation was noticed in the radial artery about three weeks after the operation. The patient left the hospital soon afterwards. Dr. Wyeth (loc. cit.) says he saw the patient a year afterwards, and that "a small hard lump, about the size of a nutmeg, could be felt to rise with the cardiac impulse, no thrill or bruit." Oct. 7, 1879, the patient returned to the hospital with Bright's disease, and died in ten days of pulmonary œdema. There is no record of any examination of the neck at that time.

The following description of the specimen has been kindly furnished me by Dr. W. H. Welch, Curator of the Hospital, who made the last dissection:—

"The specimen consists of the head, neck, thorax, and arms of a man, dissected so as to show the heart and vessels which have been filled with plaster of Paris by injection through the left carotid. As originally prepared, the upper half of the sternum was left in place, as was also much of the soft tissue enveloping the arch of the aorta and the roots of its branches. All of the sternum, except a narrow strip at the top, has now been removed, the exterior of the arch of the aorta cleaned, and an opening made in the anterior aspect of its ascending portion through which the contained plaster has been withdrawn.

"The right carotid is obliterated from its origin to within a short distance of its termination, the right subclavian is obliterated in its third portion; the branches of its 1st and 2d portions are patent, enlarged, and filled with the injection material. A small A. thyroidea ima arises from the arch just to the left of the innominate. The innominate has a diameter of $1\frac{1}{2}$ centimetres, and a length of $2\frac{1}{2}$ centimetres. The portion adjoining the origin of the carotid is thrown into small folds as if it had not been entirely filled by the injection. Upon puncturing it there is no evidence of its containing clot. The origin of the left carotid is $2\frac{1}{4}$ centimetres from that of the innominate.

"The ascending portion of the arch of the aorta has a diameter of $3\frac{1}{4}$ centimetres. There is a dilatation which involves the upper portion of the ascending arch and the adjacent portion of the transverse arch. This dilatation is most marked on the right border, and the anterior and superior surfaces of the aorta. This dilatation, which is not distinctly sacculated, projects about 2 centimetres forwards, upwards, and to the right, beyond the normal lumen of the aorta. It lies in contact with the right sterno-clavicular articulation and the adjacent portion of the sternum. Its highest point is about on a level with the upper border of the sternum. Its highest point is a dome-like secondary dilatation about 1 centimetre in height and 2 centimetres in diameter, from the summit of which the innominate artery arises by a sharply defined orifice.

"These dilatations contain no laminated clot; their wall is smooth and covered with plaster. This wall varies from 2 to 4 mm. in thickness, and apparently consists of the original coats of the artery.

"The specimen, therefore, presents an aneurismal dilatation involving the upper part of the ascending and a part of the transverse arch of the aorta. The root of the innominate is possibly likewise involved."

Two questions arise: what was the tumour observed during life, and what was the effect, if any, of the operations? It seems to be certain, especially in view of the description given of the vessels at the time of the first operation, that the tumour was formed by the upper end of the innominate, which was situated unusually high in the neck, perhaps pushed up by the dilatation of the aorta, and forward by the curving of the carotid. There is no reason to suppose that the dilated portion of the aorta (including in that term the secondary dilatation, mentioned by Dr. Welch, which may possibly have been formed partly by the lower end of the innominate) ever rose above the clavicle, for it shows no sign of having undergone a partial cure. This upper end of the innominate shows now no aneurism and no trace of a cured one; at the most, it is somewhat dilated, but there is no pouch, no fusiform expansion, and no clot within it. The fact that the tumour remained unchanged in size for a considerable time after each operation shows that there was no diminution of pressure within it, such as has been observed in one or two similar cases, and might have allowed the over-stretched wall of the vessel to re-contract. It is simpler, more in accordance with the record of the case, the facts of the autopsy, and the natural history of aneurism, to explain the apparent tumour observed during life by the unusual position of the vessels than by the hypothesis of an aneurism that has since disappeared without leaving a trace.

There is no anatomical evidence that the operations accomplished the object of starting the only process, the deposit of laminated clot, by which, as far as is known, the distal ligature can lead to the cure of an aneurism, or, in short, that they had any effect upon the innominate or the aorta. Nor is the clinical evidence much more affirmative. The tumour was "as large as a hickory-nut" at the time of the first operation, it was of the same size nine months afterwards, and remained unchanged until the patient left the hospital. A year later it is described by another observer

as being "as large as a nutmeg," and there the record ceases. It never had a thrill or bruit, and never caused objective symptoms.

As it is not known whether or not the aneurism of the aorta existed at the time either of the operations was performed, it is idle to speculate upon the effect, or the absence of effect, of them upon it.

ARTICLE XIX.

SCIATIC NEURALGIA CURED BY NERVE-STRETCHING. By NORMAN MACKINTOSH, M.D., of Gunnison, Colorado.

THE patient, Mr. A., aged 41, intelligent, and of fine physique; never had syphilis; of temperate habits, family history unimportant.

For more than sixteen years he has suffered intense pain in the thigh, knee, and foot, from sciatic neuralgia, which resisted all the ordinary therapeutic measures of treatment. At first the attacks were rare, and only lasted for a few days, but they gradually increased in frequency and intensity, until finally there were only brief intervals of absence of pain, and they lasted from five to six weeks without relaxing, during which paroxysms he ate very little and—as he said—slept *none*. He could take morphia sulphate by the grain hypodermically, without inducing sleep and without relieving the pain.

When I first saw him, four months ago, I advised an operation for the relief of his pain by stretching the great sciatic nerve. He at once consented, and I operated the next day, using sulphuric ether as an anæsthetic, and carbolic precautions.

I made a longitudinal incision over the site of the nerve five and a half inches in length, beginning at the inferior fibres of the gluteus maximus muscle and cutting downward. Cutting through the skin and adipose tissue, separating the muscles and delicately dissecting the firm connections from the adjoining parts, I laid bare the nerve and *forcibly* stretched it. The wound united by "primary union."

From the moment of the operation the patient was entirely free from pain, and when last seen, four months after the operation, he had no return of the pain, though working on the farm every day.

REVIEWS.

ART. XX.—*Die Gelenk-Resectionen nach Schussverletzungen ihre Geschichte Statistik, End-Resultate*, von Dr. E. GURLT, Professor der Chirurgie an der Königl. Friederich-Wilhelms-Universität zu Berlin. Mit 26 in den Text gedruckten Holzschnitten. Pp. 1333. Berlin, 1879. *Resections of Joints for Gunshot Injuries: their History, Statistics, and Ultimate Results*. By Dr. E. GURLT, Professor of Surgery at the University of Berlin.

WE have before us the voluminous work of the eminent Professor of Surgery at Berlin, Dr. E. Gurlt, in which he has presented the history, statistics, and ultimate results of joint excisions for shot injury; his object has been to elucidate some points in the history of these operations, that have been partially forgotten, to offer reliable statistics, but principally to present the ultimate results of resections many years after their execution,—a subject almost unexplored till now. Dr. Gurlt was led to undertake this arduous task on account of the increased number of operations performed in recent wars, and because of the existing difference of opinion regarding the final results. The report of Prof. Hannover, of Copenhagen, on the miserable condition of the Danish invalids, in whom the operation had been performed during the Schleswig-Holstein campaign of 1864, had left an unfavourable impression; it was also ascertained that the results in the Prussian invalids of 1864 did not fulfil the expectations which had been formed; and the publications regarding the effects of the operations during the Franco-German War of 1870–1871, did very little towards removing the unfavourable professional sentiment. But since most of the publications on this subject were based upon the reports of Examiners for Pensions, and presented the results only a year or two after the operation, when some of the wounds had scarcely healed, and when in the majority of cases the restoration of the functions of the limb was as yet incomplete, Dr. Gurlt entertained the reasonable hope that subsequent examinations might reveal better results. In view of these facts, and stimulated by the “Surgical Observations” of B. v. Langenbeck, published in 1874, he began to institute a re-examination of all the Prussian invalids, in whom excisions had been performed ten years before, in 1864, and after successfully completing this task he carried his examinations back to the surviving invalids, from excisions, of the Schleswig-Holstein campaign of 1848–1851. He finally utilized the available material of the wars of 1866 and 1870–1871, and refers to the rich store of information derived from the Second Surgical Volume of the “History of the War of the Rebellion.” He has, in fact, extended his researches to every published case of former wars, and thus been enabled to collect 3668 cases of excisions of joints after shot injuries, and definitely ascertained the final results or present condition in 668 invalids of this class, and the records of these, together with a detailed account of the operated limb, the extent of usefulness, etc., really constitutes the most important and valuable part of his labour.

The book is divided into three parts, the first and most voluminous of which covers 1204 pages, and treats in detail of the history of the operation of joint excisions for shot injury, from their first introduction until 1879. In his introduction to the subject, whilst pointing out that Messrs. White, Park, and Moreau the elder, were not the first to originate the operation, their merits in having been the first to establish excisions of joints on a scientific basis are duly recognized. Prof. Gurlt gives a brief preliminary history of resection of the six principal joints, beginning with the shoulder. The first recorded removal of the head of the humerus for caries, and probably partial ankylosis, appears to have been successfully performed by a German surgeon, Schaeffenbergs, in 1726, but neither this case, nor the one operated on in 1740 by Thomas, of Pézenas, in Languedoc, are regarded by the author as methodical joint excisions. The first formal excision was performed in 1771 by Mr. James Bent, of Newcastle, for caries of the head of the humerus, and for shot injury, after the fall of 1792, by Percy.

The first excision at the elbow-joint is attributed by H. Park to Wainman, of Shrimpton, as having been performed in 1759. In Jeffray's work, "*Cases of Excision of Carious Joints*," Glasgow, 1806, reference is also made to a case operated on by Justamond in 1775, and Tyre, of Gloucester. Mr. Park, in his observations published in Jeffray's work, laments the fact that but little attention has been paid to his publication of 1783, and that the practice has not been adopted in the army and navy of Britain. Dr. Gurlt, in this connection, incidentally refers to Jeffray's remarks, regarding the invention of the chain saw, and presents all the available evidence on the subject. The first resections at the elbow-joint for shot injury appear to have been performed by Percy, or under his supervision, after the fall of 1792. The first authenticated cases were operated on by Moreau, father and son, in 1794. The first excision for shot injury in the United States appears to have been performed by Dr. Otis Hoyt, during the Mexican War, 1847, in the case of an Illinois soldier, who recovered, with perfect use of the hand.

The lower extremity of the radius was excised by Cooper in 1758; the first formal excision of the wrist-joint appears to have been performed by the senior Moreau in 1794; the operation was only introduced into military practice as late as 1855. Excision of the hip-joint was first performed by Anthony White at the Westminster Hospital, London, in April, 1821, on a boy eight years old, who died of consumption five years after the operation. As early as 1769, Mr. Charles White, of Manchester, demonstrated the possibility of the operation on the cadaver. The first operation for shot injury was performed by Oppenheim in the Russo-Turkish war of 1829, and the second by Seutin in 1832. Sir Charles Bell, after the Battle of Waterloo (1815), urged the performance of the operation on Guthrie, without effect. The first excision of the hip-joint in this country was performed in 1852 by Bigelow, of Boston.

The knee-joint was excised for the first time in 1762, by Filkin, of Norwich, and subsequently by Park in 1781 and 1782; the elder Moreau performed his first operation in September, 1792, in the presence of Percy and other army surgeons. For shot injuries, the operation was brought into notice by Textor in 1847, and Knorre, 1849; the first excision in military practice was performed by Fahle, under Stromeyer's supervision, in the early part of 1851.

Excisions of the ankle-joint were performed by Moreau, senior, in 1792

and 1796, and by his son in 1815. The first reliable case for shot injury was operated on by Langenbeck in 1859, five years after the injury; in May, 1864, he operated in a recent case, while almost simultaneously the operation was performed in this country by Bontecou and Holloway.

After this brief introduction, Prof. Gurlt enters upon the consideration of all authenticated excisions of joints performed for shot injury during the several wars between 1792 and 1879. Each war or campaign is disposed of in different sections, the nature of arms and ammunition used, as well as the percentage of wounded, etc., are discussed, and the opinions of leading surgeons regarding the merits of joint excisions are freely quoted. Here we find the history of over 3600 cases, of which either abstracts or the principal facts in a tabular form are given. In addition this part contains a full description of the present condition of the operated limb in 668 surviving invalids from excision of joints, between the years 1848 and 1871. The details of these cases are very complete and interesting, and form the basis for his statistics and opinion regarding the ultimate results of the operation.

Prof. Gurlt, in his statistical part of the book, gives a general summary of excision of joints for shot injury, based upon the details furnished in the historical part of the volume; from this we learn that he has collected and tabulated 1661 cases of excision of the shoulder, with 1067 recoveries, 27 doubtful results, and 567 deaths, or 34.70 per cent.; 1438 cases of excision of the elbow-joint, with 1054 recoveries, 35 doubtful, and 349 fatal results, or 24.87 per cent.; 133 excisions at the wrist, with 112 recoveries, 1 doubtful, and 20 fatal results, or 15.15 per cent.; 139 excisions of the hip-joint, with 16 recoveries, 1 doubtful, and 122 fatal results, or 88.40 per cent.; 146 excisions of the knee-joint, with 33 recoveries, 2 doubtful, and 111 fatal results, or 77.08 per cent.; 150 excisions of the ankle, with 94 recoveries, 5 doubtful, and 51 fatal results, or 33.92 per cent. Total, 3667 cases, with 2376 recoveries, 71 doubtful results, and 1220 deaths, or 33.92 per cent. Of this large number nearly one-half, or 1716 excisions, were performed in this country. Excision of the shoulder-joint was performed in 45.29 per cent. of the total number collected by the author; excision of the elbow in 39.21 per cent.; of the wrist in 3.62 per cent.; of the hip-joint in 3.79 per cent.; of the knee in 3.98 per cent.; of the ankle in 4.09 per cent.

With a view of ascertaining the mortality after joint excisions, performed during the large wars, Dr. Gurlt has grouped the excisions performed in the five German wars of 1848-1851, 1864, 1866, 1870-1871, with those of the War of the Rebellion, which together furnished 3278 cases. Of this number 1453 cases were excisions of the shoulder, with 928 recoveries, 17 doubtful, and 508 fatal results, or 35.37 per cent.; 559 cases were examples of primary excision, with 3 doubtful results, and 177 deaths, or 31.83 per cent.; 129 of intermediate operation, with 1 doubtful result, and 68 deaths, or 53.12 per cent.; 618 secondary excisions, with 4 unknown results, and 241 deaths, or 39.25 per cent.; 27 late excisions, with 1 death, or 3.70 per cent.; and 120 excisions of uncertain date, with 9 unknown results, and 21 deaths, or 13.51 per cent.

In excision for disease the statistics show a more favourable result, 50 cases tabulated by Hodges giving 42 recoveries, and but 8 deaths, or 16 per cent. Of 1334 cases of excision of the elbow-joint, with 987 recoveries, 25 doubtful results, and 322 deaths, or 24.59 per cent., 393 cases were examples of primary excision, with 4 unknown results, and 84 deaths,

or 21.59 per cent.; 116 intermediate excisions, with 3 unknown results, and 33 deaths, or 29.26 per cent.; 690 secondary excisions, with 9 unknown results, and 194 deaths, or 28.48 per cent.; 14 late excisions, all successful; 121 excisions of uncertain date, with 9 unknown results, and 11 deaths, or 9 per cent. Heyfelder and Boeckel have tabulated 145 cases of this operation for disease, with but 20 deaths, and 7 consecutive amputations, giving a mortality of 13.8 per cent.

Of 119 cases of excision at the wrist, with 100 recoveries and 19 deaths, or 15.96 per cent., 39 cases were primary excisions, with 4 deaths, or 10.25 per cent.; 8 intermediate excisions, with 3 deaths, or 37.50 per cent.; 53 secondary excisions, with 12 deaths, or 22.64 per cent.; 7 late excisions, all successful; and 12 excisions of uncertain date, all successful. The statistics of wrist-joint excision for disease are not as favourable, 31 terminated cases tabulated by Hodges giving 6 deaths, or 19.35 per cent., and 8 subsequent amputations.

Of 119 cases of excision of the hip-joint, with 11 recoveries, 1 doubtful, and 107 fatal results, or 90.67 per cent., 35 cases were examples of primary excision, with 2 recoveries, 1 unknown result, and 32 deaths, or 94.11 per cent.; 16 intermediate excisions, with 1 recovery and 15 deaths, or 93.75 per cent.; 64 secondary excisions, with 7 recoveries and 57 deaths, or 89.06 per cent.; 4 late excisions, with 1 recovery and 3 deaths, or 75 per cent. The statistics of hip-joint excision for disease show a much more favourable result. Dr. Ashhurst has collected 376 cases, of which the results are known in all but 49. The total number of recoveries is 164, and of deaths 163, or 49.85 per cent. of the terminated cases.

Of 116 cases of excision of the knee-joint, with 21 recoveries and 95 deaths, or 81.89 per cent., 30 cases were examples of primary excision, with 10 recoveries and 20 deaths, or 66.66 per cent.; 10 intermediate excisions, with 1 recovery and 9 deaths, or 90 per cent.; 70 secondary excisions, with 8 recoveries and 62 deaths, or 88.57 per cent.; 2 late excisions, both fatal; 4 excisions of uncertain date, with 2 recoveries and 2 deaths, or 50 per cent. The statistics of the operation for chronic disease are by far more favourable. Of 431 cases collected by Pénicières 300 recovered, and 131, or 30.4 per cent., died.

Of 137 cases of excision of the ankle, with 85 recoveries, 4 uncertain, and 48 fatal results, or 36.09 per cent., 7 cases were examples of intermediate excisions, with 3 deaths, or 42.85 per cent.; 127 of secondary excisions, with 4 unknown results and 44 deaths, or 35.77 per cent.; 1 late excision (successful); 2 excisions of uncertain date, with 1 death, or 50 per cent. The statistics of excision of the ankle-joint for disease show a more favourable result; of 51 cases collected by Spillman, 35 recovered, 10 died, 1 the result not known, in 5 subsequent amputation was performed. Mortality per cent. of terminated cases 20 per cent.

Dr. Gurli also adduces the interesting fact, that our surgeons performed primary excisions in more than 54 per cent. of their cases, and the Germans in only 9 per cent.; on the other hand, our surgeons performed secondary excisions in only 29 per cent., and the Germans in about 70 per cent. of their cases.

In the 3280 cases of excisions above referred to, consecutive amputation was required in 152 cases, with 78 deaths, or 48.34 per cent.; these amputations were necessary after excision of the shoulder in 1.65 per cent.; of the elbow in 7.04 per cent.; wrist in 9.24 per cent.; knee in 4.31 per cent.; and ankle in 12.95 per cent.

The principal causes of death in 474 fatal excisions at the shoulder are stated as follows: pyæmia 157, septicæmia 19, tetanus 5, gangrene 12, hemorrhage 20, exhaustion 58; total 271 determined cases. In 304 fatal cases of excision at the elbow, the principal causes of death are stated as follows: pyæmia 146, septicæmia 5, tetanus 2, gangrene 5, hemorrhage 3, exhaustion 25; total 186 cases. Pyæmia was the most frequent cause of death after excisions at the wrist; and after primary excisions of the hip-joint, collapse, shock, exhaustion, and septicæmia are mentioned, while after intermediate and secondary excisions, septicæmia, pyæmia, and exhaustion from suppuration and hemorrhage appear to have been the principal causes of death. After excisions at the knee, pyæmia was the cause of death in 44 cases, septicæmia in 13, exhaustion 6, dysentery 4, tetanus 3; hemorrhage in 2 cases.

After excision of the ankle the principal causes of death are stated as follows: pyæmia 21, septicæmia and gangrene 6; exhaustion 8; subsequent amputation 12.

We have already stated that Prof. Gurlt has collected the ultimate results of joint excisions in 668 cases, of all of which the historical part of the volume contains full details.

The third part of Prof. Gurlt's work is devoted to an analysis of the ultimate results of joint excisions, and is replete with interesting facts. The author says:—

“In order to compare the final results of joint excisions for shot injury, it became necessary to adopt some classification. In doing so I have arranged them into five classes, and, in discriminating between these, I have laid more stress upon the more or less regained usefulness of the limb in general, and less so on the best possible restoration of the normal form or function of the respective joint. So, for instance, in the case of the elbow-joint, where the most perfect recovery is followed by the restoration of almost normal mobility of the joint, I regard, under certain circumstances, the final result a very good one, even though there may be immovable union, so long as the arm and hand, regardless of the impossible extension and flexion, approximates in usefulness the sound extremity. In my classification for all joints, not only in those in which the after-treatment aims to secure a movable false joint, as in the shoulder, elbow, wrist, and hip, but also in those, where, as yet, recovery with ankylosis is regarded most desirable, as in the case of the knee and ankle-joint, I make a distinction between both forms of recovery, and designate the movable union with *a*, the immovable union with *b*. The first class comprises those results, which, in view of the excision, are the best obtainable, as for instance in the shoulder, elbow, and ankle-joint, an almost complete restoration of the normal form and functional utility of the limb, or at least the latter alone; also those cases in which a most perfect result is not obtainable and in which shortening of the limb, as in the hip and knee-joint, is unavoidable, so long as the greatest possible restoration of functional utility is obtained. The second class includes those cases, in which the best possible result has not been attained, but in which the limb is useful. In the third class, the usefulness of the limb is limited, and artificial appliances are necessary. In the fourth class, the usefulness of the limb is either suspended or totally wanting. In the fifth class of cases the limb is not only useless, but also a burden to the owner.

“Expressed in a few words the classes correspond to the following results: Class I. ‘very good,’ Class II. ‘good,’ Class III. ‘middling,’ Class IV. ‘bad,’ Class V. ‘very bad,’ *a*, with movable *b*, with immovable union.”

The ultimate results of 213 cases of excision at the shoulder, performed in German soldiers from 1848 to 1871, are classified as follows: Class I., *a*, 4; Class II., *a*, 84; *b*, 6; Class III., *a*, 92; *b*, 10; Class IV., *a*, 12; *b*, 5. The ultimate results of 355 excisions of the elbow-joint are classified as

follows: Class I., *a*, 17; *b*, 3; Class II., *a*, 50; *b*, 34; Class III., *a*, 125; *b*, 64; Class IV., *a*, 38; *b*, 13; Class V., *a*, 9; *b*, 2. The ultimate results in 16 excisions of the wrist are given as follows: Class II., *a*, 1; Class III., *a*, 6; *b*, 2; Class IV., *a*, 4; *b*, 2; Class V., *a*, 1. The ultimate results of 4 hip-joint excisions are as follows: Class I., *a*, 1; Class II., *a*, 2; *b*, 1. The ultimate results of 9 excisions of the knee-joint are classified as follows: Class I., *b*, 5; Class II., *a*, 1; *b*, 2; Class V., *b*, 1. The ultimate results of 55 excisions of the ankle are classified as follows: Class I., *a*, 1; *b*, 7; Class II., *a*, 7; *b*, 14; Class III., *a*, 11; *b*, 12; Class IV., *a*, 1; Class V., *a*, 1; *b*, 1.

The ultimate results of 213 excisions of the shoulder were favourable (Class I. and II.) in 94 cases or 44.13 per cent.; unfavourable (Class III., IV., and V.) in 119 cases or 55.86 per cent.; 355 excisions of the elbow-joint yielded 104 or 29.29 per cent. favourable, and 251 or 70.70 per cent. unfavourable results; 16 excisions of the wrist yielded 1 or 6.25 per cent. favourable, and 15 or 93.75 per cent. unfavourable results; 4 excisions of the hip-joint yielded 4 or 100 per cent. favourable results; 9 excisions of the knee-joint yielded 8 or 88.88 per cent. favourable, and 1 or 11.11 per cent. unfavourable results; 55 excisions of the ankle yielded 29 or 52.72 per cent. favourable, and 26 or 47.27 per cent. unfavourable results. Total 240 or 36.81 per cent. favourable, and 412 or 63.19 per cent. unfavourable results.

Prof. Gurlt concludes his work with the following observations, which we quote in full for the benefit of our readers:—

“In reviewing the ultimate results of joint excisions for shot injury, as presented for the several joints in the preceding pages, the general impression received is not a favourable one; it is especially true that the ultimate results after excisions of the shoulder and elbow-joint, so largely practised in our recent great wars, and of most importance as regards the preservation of the capacity for labour in the injured individual, have not come up to the ideal of the majority and are, generally speaking, much more unfavourable than those obtained in civil practice, after so-called pathological excisions, or those performed for disease.

“If we inquire into the causes of this strange difference, we should suppose that the excisions performed in wounded soldiers, who are mostly strong, young, and healthy men in the bloom of life, should furnish better results than the other class in which the respective individuals are frequently suffering from some dyscrasia, or are broken down by long-continued suffering or suppuration. I look for the cause of this difference in disfavour of soldiers in the following circumstances, viz.: 1. Injury of the joint by a bullet: this, of course, is at times slight, while in some instances it is so great as to require excision of one or all of the articular extremities to an extent never required for pathological conditions, the remaining small and narrow sawn extremities are not calculated to favour the formation of a new joint; again, owing to the extensive excisions, the muscular insertions are at times too closely approximated, and unable to contract to a corresponding degree, they simply fail to exert, after recovery, a sufficiently powerful influence. Since the wars of 1848–1851, during which smooth-bore guns and round bullets were almost exclusively used, an increase in the extent and intensity of injuries of the bones has been observed, so that a certain difference will also be found in the results of the cases operated on then or before that time, when the comminution of bones was less extensive than those of more recent wars. 2. The occasional severe injuries of the soft parts in the vicinity of joints, from shell fragments, etc., are necessarily a cause of more unfavourable results. 3. The unfavourable surroundings of patients in time of war, especially the occasional but unavoidable overcrowding of the wounded, insufficient food, care, and transportation as compared with the advantages of a well-regulated hospital or home, as well as the necessary dispersion of the wounded, subsequent treatment at their

homes or in private houses, and indolence of the patients, are fruitful causes of bad final results. 4. Faulty operations and after-treatment are more apt to occur in times of war, when some inexperienced surgeons are called upon to perform operations, while in civil practice most of the cases fall into the hands of experienced operators. 5. The prospect of a pension, which increases with the degree of uselessness of the limb, is a sufficient inducement to worthless and lazy individuals religiously to abstain from doing anything towards the restoration of the functional utility of the limb; this is a reason which, of course, only applies to exceptional cases in civil practice. These, then, are the external conditions which help to swell the number of unfavourable final results, after excisions, in military practice.

"The principal local conditions which render the use of the limb difficult or almost impossible are briefly the following: (1) Insufficient contact of the sawn ends of the bone, below each other (elbow-joint) or with the unresected part of the joint (shoulder-joint), in consequence of great loss of substance; in such cases the peripheral part of the extremity will have no central support. (2) Original smallness of the sawn ends (in consequence of the same condition), or subsequent atrophy of the resected parts of the joint, rendering an extensive contact of surfaces, so essential for the function of a joint, impossible; but a longitudinal displacement of the resected extremities, induced by muscular contractions, very probable. Further, in consequence of deficient contact of the sawn surfaces, there may be (3), absence of the formation of a new true joint in place of the resected (shoulder- and elbow-joint); since (4) we may find instead a formation of a more or less long and loose fibrous mass, which in the elbow-joint permits not only of extensive lateral motion, but also, in certain cases, of a flail-like dangling of the peripheral part of the limb (upper and forearm), and even of a rope-like twisting and turning of the extremity. (5) The formation of numerous osteophytes on the sawn surfaces may occasionally, even in movable unions, prove an obstacle to mobility. (6) The usefulness of the limb will be decidedly impaired in cases of recovery with ankylosis or synostosis, when the peripheral part of the extremity is firmly united with the central parts at an unfavourable angle, resulting in almost complete extension or twisting of the forearm after excision at the elbow, lateral deformity of the hand when performed at the wrist, flexion in the knee-joint, and a 'pointed toe' or club-foot after excision of the ankle-joint. (7) Weakness or inefficacy of the muscles are very important factors in the production of faulty final results, and may be due to close approximation of the muscular insertions after extensive resections, division of the same during the operation, and regeneration and re-attachment of the fibres in places where they can exert little or no influence on the movements of the limb. Atrophy and paresis of the muscles are usually the result of inactivity, and rarely if ever due to actual lesions of the nerves. In consequence of all these conditions, active muscular contractions are either very much diminished or rendered impossible. (8) Stiffness and deformity of the finger- and toe-joints are frequent causes of bad final results, and, unfortunately, are mostly due to careless after-treatment. (9) Injuries of the nerves (ulnar nerve, for example), either caused directly by the missile or afterwards by fragments, and during the operation may lead to more or less disturbance of innervation in the muscles of the fourth and fifth finger. (10) Painful affections in the extremity of various origin, of a permanent or periodical nature, occurring, for example, in the cicatrix, and proceeding from a principal nerve (neuromata of the ulnar nerve), and partly caused by changes in temperature; objective, but more frequently subjective reduction of temperature; abnormal, copious perspiratory secretion, together with other unfavourable phenomena, render the unsparing use of the resected extremity difficult. (11) While the presence of fistula and discharge of small sequestra interfere but little with the use of the limb, they may at times be the cause of renewed inflammatory action, and are, therefore, not to be regarded as insignificant.

"I shall endeavour to answer the much-debated question, whether, in the majority of cases, the provisional results, or those obtained shortly after recovery, remain stationary, or whether the extremity is susceptible of improvement, or even deterioration in the course of years after the operation.

"From the many examples adduced in the first part of this work, it may be confidently asserted, that much depends upon the intelligence, good-will, and energy of the individual, to render the final result either better or worse. Just as in civil practice, where the respective individuals faithfully endeavour to regain the best possible use of their limbs, upon which they mostly depend for a livelihood, and thereby, as we have seen, really succeed in attaining better final results, so we observe a similar desire on the part of the more educated class (officers, volunteers, and others), who neither lack intelligence nor good-will and industry. I have no doubt that, in case of unfavourable provisional results, it is within the power of invalids, under proper medical guidance, of materially improving their condition.

"Active and passive motions, together with a systematic use of the limb, will greatly improve the atrophy and paresis resulting from muscular inactivity, and promote the mobility of stiffened fingers, while a passive dangle-joint, which perchance may at the same time be present, will gradually gain in firmness by the use of a suitable appliance or apparatus, and thus be transformed into an active, movable joint. Again, if motion in the respective joint, owing to partial ankylosis, is limited, there is nothing better towards facilitating the production of a movable joint than methodical gymnastic exercises, constant use of the limb for the ordinary purposes of life, and, when practicable, the use of electricity, thermal-moore-baths, etc. It is to be remembered, that some of the best-known results were only obtained after years of faithful and energetic perseverance on the part of the patient. If, on the other hand, the patient not only fails to exert himself towards improving the condition of the limb, but studiously aims at a deterioration in order to enlist sympathy or obtain an increase of pension; if he neglects to use the limb at all, places it in a sling, or pins it to his coat—scarcely attempts to use the leg, or causes the limb to dangle on his side like a flail, it would indeed be a wonder if the atrophy and paresis did not materially increase, and the loose fibrous tissue of the dangle-joint become more relaxed. It may be regarded as an established fact, that the more illiterate, indolent, and lazy the individual, the more we may expect an unfavourable final result after joint excisions.

"Having learned the external and local conditions which so frequently exert an unfavourable influence on the final result of joint excisions for shot injury in military practice, the question arises, Had we better abstain in future wars from excisions altogether, or perform them only to a limited extent, and adopt, in shot injuries of joints, an expectant or conservative treatment; or, in exceptional cases, amputation instead? Unfortunately, for reasons given on p. 1210, we are not in a position to adduce sufficient evidence, as regards the life of the patient, or ultimate results, for or against one or the other method; we can only judge by the impressions which the collection and comparison of a large number of joint excisions convey to us. These impressions show, that doubtless in numerous cases of gunshot wounds of joints, treated for a longer or shorter period on the expectant plan, the gradual approach of danger to life has been removed by the operation, as shown by a rapid decline of fever, etc. If it is true, that under certain circumstances it has preserved life, the operation, as compared with amputation, must be regarded as justifiable, even though the final result may not be favourable; which, however, cannot be foreseen at the time of the operation. It is true, we have become acquainted with a few cases who assert that they would probably feel better, and enjoy greater capacity for labour, if amputation instead of excision had been performed. These assertions, however, are only based upon certain ideas which they entertain of the condition of individuals in whom amputation was performed, and who are by no means free from various complaints in their stumps or in the use of their limbs. In reality, there have been but five cases who preferred to have their useless limbs amputated. The condition of a resected limb (elbow-joint, for example) must indeed be very objectionable if it did not afford some advantages over a stump of the upper arm.

"If secondary excisions, as a means of saving life, are fully justifiable, the question arises whether the same is true of primary and intermediate excisions. As already indicated on p. 1228, if the antiseptic treatment of wounds in military practice is generally adopted, it is to be presumed that hereafter most of the

operative interference will fall into the primary and intermediate period of the wound. In case this is done, and all injuries of joints are treated with strict antiseptic precautions, there is no doubt that, for reasons adduced on p. 1228, the number of methodical excisions of joints will be decidedly diminished. If without formal excision, and under continued antiseptic treatment, the case pursues a favourable course, an injury will have been repaired which, under ordinary circumstances and former treatment, no matter how slight the injury to the bone, would probably have necessitated a secondary excision of the joint (frequently total) in consequence of the inevitable chronic suppurative inflammation.

"As soon as we find in our examination of an injury with opening of the joint, extensive comminution of bone, it would be a surgical mistake if we did not endeavour to simplify and remedy the injury, if admissible at all, by means of the most approved method of excision and thus insure more favourable conditions for recovery. Herein lies therefore the justification of primary and intermediate excisions, just as, under certain circumstances, when, in consequence of the extent of the injury or other reasons, neither expectant treatment nor excision appears admissible, ablation of the limb becomes necessary. In the intermediate cases, the performance of one or the other operation will doubtless frequently exert an antipyretic influence, and thus lead to a more favourable course of the case. I believe I have shown, that in the future and notwithstanding the antiseptic treatment of wounds, joint excisions cannot be entirely dispensed with, any more than amputations, although they may be less frequently performed.

"The question arises, what precautions must be adopted to render the final results of excisions less unfavourable than heretofore? Let us commence with the operation, which should always be performed under antiseptic precautions and according to the rules laid down for the several joints on pp. 1233, 1245, 1255, 1266, 1274 and 1279, the excision whenever practicable should be sub-capsular and sub-periosteal. The rough and sharp edges or corners of the bone should be neatly rounded off with a file or chisel to prevent subsequent necrosis of the soft parts, induced by pressure of the sharp extremity. After excision the extremity must be perfectly immobilized by means of the special dressings recommended for the several joints, this should be done, whether we subsequently aim to secure a movable joint or a synostosis, in which case of course the preserved capsules of the joint and periosteal cylinders should either be extended, or the sawn extremities be brought and held closely together.

"It is scarcely necessary to refer to the importance of antiseptic after-treatment. During the progress of the case and until healing has taken place, care must be taken that the dressings insure absolute immobility of the extremities of the bone, which in case recovery with a synostosis is contemplated, should remain permanent; in cases where we expect to obtain a movable joint, we may during this time, barely permit a change in position (elbow-joint for example, p. 1251). All attempts to resort to methodical movements before cicatrization of the soft parts has fully taken place, are decidedly to be deprecated, as having accomplished heretofore much harm; premature traction upon recent cicatricial tissue leads very readily to relaxation and a 'dangle-joint'. Since the most perfect degree of mobility in resected limbs is only obtained after years of continued practice, there is no necessity for hurry in beginning the movements. There are, however, cases, as pointed out on pp. 1239 and 1251, in which we cannot look too soon towards the preservation of motion in the finger and toe-joints, which owing to stiffness and deformity, the result of long rest and immobility, have frequently led to useless hands, but sufficient time must be given to the reproduction of the divided muscular insertions concerned in the movements of these joints (for instance the extensors and flexors inserted on the condyles of the humerus).

"After cicatrization of the soft parts has taken place, and movements can be safely begun, we should pay particular attention to the treatment of muscular atrophy the result of inactivity, and which is best accomplished by the methodical and continued use of electricity and rational gymnastic exercises. At this time the more the invalid uses the operated limb and performs active motions together with systematic exercises, the more we may expect a speedy and favourable result. In mobilizing the elbow-joint, especially if a lateral motion is perceptible

ble, we may resort to the apparatus referred to on p. 1252, which permits only of accurately graduated excursions in certain directions during the active use of the limb. If fistula and pain remain after recovery, the use of thermal baths, and for stiffness of the joint moore and animal baths may be advantageously resorted to. In the execution of joint-excisions and their after-treatment, it will be well to remember that the former, as long as properly done, is generally of less importance to the final result than the latter, which alone is decisive and requires therefore all the attention and ingenuity on the part of the attending surgeon.

"At last we shall answer the question, how those wounded in joints are best cared for in time of war. It has already been stated that the vicissitudes, which they with other wounded encounter, are at times unavoidable, still with a good sanitary organization, it ought to be possible to pay special attention and render speedy assistance not only to this class, but also to those of other categories, p. 1228. If joint-excisions are practised on the field or in general field hospitals they are certainly not the proper place for subsequent treatment, which requires so much time and attention; they should, with exception of the cases of excision at the hip- and knee-joint, be transferred as soon as practicable after reaction has taken place, care being taken to apply dressings which render motion in the parts simply impossible. Instead of turning such cases over to reserve society or private hospitals, they should be sent to a hospital specially designated for the reception of wounded of this class, and which affords all the necessary resources for the treatment of these cases, including thermal baths, electric apparatus, etc.; circumstances point to the 'Wilhelm's Hospital' at Wiesbaden as a suitable place.

"The authority of experienced regular army surgeons is also better calculated to prevent attempts of malingering, etc., on the part of patients, than when surgeons from civil life, whose connection with the service is only temporary, have charge.

"By adopting a course based upon the foregoing rules, it is hoped that it will be possible in future wars to obtain better average results than heretofore."

In closing this synopsis we have only to regret, that it appears to have been impossible for the author to furnish in his elaborate treatise more data regarding the pathologico-anatomical conditions of the resected parts at late periods after the operation. Prof. Gurlt only refers to two cases, in which autopsies were made after excision at the shoulder, and five cases after excision of the elbow-joint, the dissection in two of the latter cases was made after ablation of the limb, although a considerable number of pensioners are known to have died. Surgeon Otis, p. 660, 2d Surgical Volume of the War of the Rebellion, laments the fact, "that in the infrequent instances of deaths at remote periods after the operation, the valuable opportunities for ascertaining the conditions of the parts appear to have been neglected, which is the more to be regretted as science possesses so few precise facts on this subject." As there are now a large number of survivors of operations of this class in the United States, it is hoped that no opportunity for ascertaining the anatomical conditions of the respective joint after death, will be lost in future. From the remarks of Dr. Otis on p. 657, 2d Surgical Volume, it appears to be the intention of the Pension Bureau to institute an inquiry into the exact condition of the limbs that have undergone excisions. It is to be hoped that this will be done, as the material for furnishing precise data is unprecedentedly large in this country, and should be utilized not only for the information of the Pension Office, but also in the interests of science, and as Dr. Otis hopes to revert to the subject of end-results of excisions in the 3d Surgical Volume, an excellent opportunity would be afforded to place the evidence on record, and if our Southern *confrères* would institute a similar inquiry into the final results of excisions performed on Confederate soldiers, the question,

as to how far the prospect and receipt of a pension influences the retained utility of the limb, could be fairly determined.

Prof. Gurlt's work, the result of five years' labour, is a monument of painstaking research, and must remain for a long time the standard work of reference for information on the important subject of which it treats.

G. M. K.

ART. XXI.—*A Practical Treatise on the Diseases of Women.* By T. GAILLARD THOMAS, M.D., Professor of the Diseases of Women in the College of Physicians and Surgeons, New York, etc. Fifth edition. Enlarged and thoroughly revised. 8vo. pp. 806. Philadelphia: Henry C. Lea's Son and Co., 1880.

SIX years ago the fourth edition of this valuable work was issued, and now the fifth is presented us with some very obvious changes. The first of these which strikes the examiner is that of type. The previous editions were printed in small pica, but this in long primer, and thus there is a gain of one fifth of reading matter in an equal number of pages: this number is about the same as that of the last edition. The number of chapters has been increased from forty-eight to fifty-three, and of illustrations from one hundred and eighty-six to two hundred and sixty-six.

Coming to the examination of the book itself by chapters, we find very few alterations or additions in the first, the historical sketch of gynecology: Dr. Emmet's recent work is highly complimented, and antiseptic surgery is spoken of as probably one of the greatest advances made in the art of surgery.

Dr. Thomas still warmly advocates Sims's speculum in examinations. With this instrument, the patient lying on her side, "the cavity of the uterus can be probed with perfect ease," etc. He then states, in reference to this great superiority of the instrument of Sims, "it may be very pertinently asked how I reconcile this opinion with the facts that with the exception of Emmet and myself no other writer of a systematic treatise on gynecology recommends this method of exploration in preference to that by the cylindrical speculum in daily practice; that few, if any, of the gynecologists of Great Britain or the continent of Europe employ it to the exclusion of the old plan," etc. The cylindrical speculum is hardly an instrument in daily practice, at least by the recommendation of eminent recent gynecologists. Gallard, for example, limits its use to the recognition of the position of the uterus and to the application of a cautery, either actual or chemical. Le Blond states that the speculum which he prefers for examination is Ricord's bivalve. Dr. Churchill chose for minute examination, the quadrivalve of Ricord, and reserved the cylindrical for the application of leeches, the use of caustic, etc.

But we wished, in reference to Dr. Thomas's statements, to call attention to the appreciation of Sims's instrument by Dr. Chrobak. Dr. Chrobak states that

"by this method of speculum examination, which is unfortunately not generally practised, one sees the parts most satisfactorily. . . . The examination by the finger and sound is unhindered, the application of the latter rendered much easier. For many therapeutic and operative measures there is sufficient accessibility; by a tenaculum the posterior lip can be drawn down, and one can see a short distance in the cervical canal. . . . The great objection to the use of

this speculum is that a third party is always needed, and this will prevent its general adoption. In hospitals this objection is of no importance, but in private practice, the patient may object even to a female assistant, and then too there is a difficulty in always having such assistant with you."¹

This seems to us quite a just appreciation of the instrument.

The second chapter, *The Etiology of Diseases peculiar to Women*, presents some new causes of disease peculiar to women, *e. g.*, constipation, neglect of physical development, overwork of brain, non-recognition or neglect of injuries due to parturition. The following statement is made:—

“Among our farming population, where all the out-door work is done by the males, the women commonly take less exercise in the open air than do those in our cities, and much of their time is spent in rooms heated by stoves which cook the air and render it dry and unwholesome.”

Conceding the propriety of the cooking figure, and the fact of the frequent use of stoves in the country, the rest of the statement we very much doubt. Most of the farmers' wives and daughters, at any rate in the west and northwest of our country, are quite as much in the open air as females living in our great cities, more indeed, probably, than thousands of New York shop girls and sewing women: their lives are very far from being in-door and sedentary.

We wish Dr. Thomas had devoted more space to the consideration of the injurious effects of intense mental application at the period of puberty, and the importance of giving girls at this transition period better opportunities for physical development even if education must be delayed a year or two. That valuable book by the late Dr. Edward H. Clarke upon *Sex in Education* should be in the hands of every physician, of every teacher, and of all intelligent parents. Obedience to its instructions would prevent many a woman from becoming the victim of disease.

The third chapter, *General Considerations upon Uterine Pathology and Treatment*, is nearly the same as the twelfth chapter of the fourth edition. Dr. Thomas, p. 59, still holds to Virchow's distinction between *hypertrophy* and *hyperplasia*, a distinction which we think, with Bœckel, is a mere subtlety of language; hypertrophy inevitably results in hyperplasia, the latter cannot occur without the former, not only as antecedent but as cause.

The fourth chapter is new as to its title, *General Considerations upon some of the most important Therapeutic Resources of Gynecology*, and is almost entirely new as to its contents. About four pages are devoted to *pessaries*,—the word devoted ought to be italicized, for probably with the exception of the late Dr. Hodge, no American writer of note upon diseases of women, has been so warm an advocate of these instruments as is Dr. Thomas. He observes on p. 69:—

“In spite of all its attendant evils, the use of the pessary is, as I have said before, one of the most important points in gynecology, and every practitioner of that art should make it a faithful, special, and constant study. I confess that when I am told, as I sometimes am by physicians, that they never use pessaries, because they are so strongly prejudiced against them, the question always arises in my mind, then how and why do you treat uterine diseases? How pessaries can be dispensed with, is to me one of the unfathomable mysteries of gynecological practice.”

Unfathomable mystery expresses the difficulty of the case about as strongly as the English language permits, if indeed it does permit.

¹ *Handbuch der Frauenkrankheiten*. First part. Stuttgart, 1879.

Dr. Thomas is not less earnest in his advocacy of antiseptic means, stating that the following rules should always be observed in operating on the female genitalia:—

“1st. Before and after every operation wash all instruments in very hot carbolized water, and during every operation keep all instruments immersed in carbolized water. This should be especially observed in regard to needles and sutures.

“2d. In all laparotomy operations pursue Lister’s antiseptic method fully.

“3d. Where the spray is not employed always bathe denuded surfaces, both before and after apposition by suture, with carbolized water.

“4th. Always destroy sponges used in an operation which admits of the possibility of these being contaminated by septic fluids, and when they are employed a second time always have them immersed previously in boiling carbolized water.

“5th. After all operations upon the uterus bathe or spray the vaginal portion of the organ with carbolized water, and tampon lightly for twenty-four hours with antiseptic cotton. This being removed, syringe the vagina with carbolized water at short intervals.

“6th. After all operations on the pelvic organs, syringe the vagina with carbolized water as often as once in every eight hours.

“7th. After all operations quiet pain and nervous excitement by opium.

“8th. Before all grave operations give a full dose of quinine, ten to fifteen grains.

“9th. Before every operation let the operator and his assistants cleanse and disinfect their hands as if they felt sure that septic material attached to them.

“10th. Avoid even trivial operations, unless good reason for doing otherwise exist, for a few days before and after menstruation.”

The order of the rules seems a little confused—some of the first things placed last—and possibly these ten commandments are not as sacred as other more familiar ten; possibly, too, occasional disobedience of the seventh might be venial, for opium need not be used in every case of pain and nervous excitement; the degree, the cause, and continuance of these should have some weight: yet they are excellent rules, and ought to be engraved on every operator’s mind.

The fifth chapter, *Diagnosis of the Diseases of the Female Genital Organs*, corresponds with the third chapter of the fourth edition; a few additions, however, to the text and illustrations have been made. We are glad to see that Dr. Thomas gives less approval to Simon’s method of rectal exploration, and would strictly limit it to a few rare cases.

In considering the dangers from tents, Dr. Thomas remarks: “Had all the fatal cases which have resulted from accidents due to tents been faithfully recorded, the list would now be a long one, and it would be greatly lengthened by a record of all the instances in which tedious, exhausting, and dangerous disease has thus been excited.” But how can a list of fatal cases be lengthened by any number of non-fatal ones?

The sixth chapter, *Congenital and Infantile Malformation of the Female Sexual Organs*, is, we believe, entirely new. And yet it is a chapter which is of great interest and importance. The embryology of the female sexual organs is briefly given, and thus the key to so-called malformations of these is presented.

Diseases of the Vulva, which were considered in the fourth and fifth chapters of the fourth edition, now occupy two chapters, the seventh and eighth. The text is almost the same, but a new illustration is given, viz., that of Paquelin’s thermo-cautery, an instrument which has become almost essential in gynecic practice.

The ninth chapter, *Anatomy, Physiology, and Pathology of the Perineum*, is new, and is one of the most important additions to this issue.

Dr. Thomas holds that not only writers upon anatomy, but also those upon obstetrics, neglect to describe the perineum, devote too little space to its consideration. He remarks that "obstetric writers may defend this omission by the assertion that they do not write of anatomy, but of obstetrics, and that the student should come to them informed upon this subject." But if he were to turn to the first fasciculus, issued in 1878, of Tarnier and Chantreuil's¹ work, he would find several pages devoted to the perineum. The chapter contains numerous illustrations, but both with these and the text the profession is familiar from their having already been published as a contribution to the *American Journal of Obstetrics*.

The tenth chapter, *Prolapse of Vagina, Bladder, Rectum, and Intestines*, presents only here and there small additions to the consideration of these subjects in the fourth edition. Le Fort's operation of elytrorrhaphy is given on page 181; it is taken from Le Blond's work, but unfortunately the illustrations are omitted, and without these the text is at least difficult to understand.

In chapter eleventh, the treatment of rupture of the perineum is stated very clearly, very fully. We think still, as we have stated in a previous review, that Dr. Thomas is in error in not including in his classification central rupture.

Vaginismus and *Vaginitis*, the subjects of chapters twelfth and thirteenth, present no noticeable changes from the text of the fourth edition.

Chapter fourteenth, upon the subjects of *uterine and menstrual retention*, gives much new matter and several new illustrations. Fig. 84 represents a case of vaginal atresia, where the menstrual accumulation is limited to the vagina, the uterus being empty. Hubert² refers to this condition, stating that in some cases the uterus in the form of a small, rounded and firm tumour is pushed up as high as the umbilicus.

Dr. Thomas seems to favour in imperforation of hymen or uterus, where there is large accumulation, gradual rather than rapid discharge, and in this his teaching is more in accordance with the practice so strongly insisted upon by Bernutz than that of Emmet. When there is entire closure or absence of the vagina, Dr. Thomas states that Dr. Barnes expresses his preference for Dupuytren's rather than Amussat's operation, and he coincides with him. But had not Courty before Barnes, and Puech³ still earlier expressed such preference?

The operation of Dupuytren first has the date of 1818, and then a few lines further on, in a quotation from Courty, that of 1817, which is the correct one. Amussat's operation is said, p. 229, to consist "of working with the finger and dull instruments, overcoming resistance by pressure rather than by incision, and completing the operation not in one but several sittings." Then on pp. 230-1 Amussat's operation is given in detail, curved scissors are used, as well as pressure, and the operation apparently accomplished at one sitting. Now we do not quite see the correspondence of the two statements. We do not find in Puech,⁴ nor in Fabre,⁵ who gives the full report of Amussat's operation as read before the French Institute November, 1835, the least mention of the use of any cutting instrument.

¹ *Traité de l'Art des Accouchements*.

² *Cours d'Accouchement*, 1878.

³ We find this word sometimes Peusch, again Puesch, but never correctly given, an error of orthography which has been carried down from the fourth edition at least.

⁴ *De l'Atresie des Voies Génitales pour le Docteur Albert Puech*, Paris, 1864.

⁵ *Bibliothèque du Médecin-Praticien*.

Fistulæ of the Female Genital Organs is the subject of the fifteenth chapter. Some may think there is not a sufficient recognition of the great value of Simon's position and instruments in the exposure of fistulæ. Certainly from some little experience with these such is our opinion. In regard to uretero-vaginal fistulæ, Dr. Thomas refers to two cases in this country recently reported, but still fails to mention the first American case. As to operating for *closure of the vagina*, Dr. Thomas states that Vidal did it in 1833, paring the surfaces of the labia majora and uniting them by sutures. According to Le Double,¹ Vidal's first operation was by cauterization, the second by vertical elytrorraphy, but each in 1832.

The sixteenth chapter, *Fecal Fistulæ*, contains no new matter.

The seventeenth, the thirteenth of the fourth edition, is upon *Acute Endometritis*, and contains no material changes. The same remark applies to the eighteenth chapter, which is entitled *Chronic Cervical Endometritis*. In the nineteenth chapter, *Chronic Corporeal Endometritis*, Dr. Thomas remarks in reference to applications to the uterine cavity:—

"Upon theoretical grounds direct applications to the diseased endometrium would hold out a brighter promise of cure than any other plan of treatment, and during the past quarter of a century it has become the conventional habit to recommend them. In this habit I have shared, until closer observation and enlarging experience during the past five years have led me to become sceptical as to the utility of the course. Observation and experience have so changed my practice that I find myself very rarely resorting at present to applications above the os internum uteri. That they may become necessary in certain cases I do not at all deny; but I maintain that they should not be habitually resorted to: 1st, because they very generally fail in curing the disease; and 2d, because they are by no means void of danger. That a certain number of cures of pelvic peritonitis and cellulitis are created by these applications all must admit. In spite of this fact their use would be decidedly vindicated were their results very promising. But in my experience their results are not promising, and for this reason I have given up their general use."

Subsequently he remarks:—

"It may now be asked, since I oppose the habitual practice of carrying applications above the os internum uteri, as well as that of injecting the uterine cavity, what course I do advise and adopt in the management of this affection. As I have already stated, I would recommend careful attention to the general state, removal of displacements, care of laceration of the cervix, extirpation if possible of any existing neoplasm, and if uterine enlargement exist, the free use of ergot." . . .

He also refers to certain cases in which the dull wire curette is of great utility. Probably Dr. Thomas is right in his rejection of intra-uterine applications, and it is to be hoped his words will have proper weight with the profession. Supposing that he is right, surely he might have thrown out the six or seven pages in which he describes the various means of applying liquids, semi-solids and solids to the uterine cavity. If this treatment be dangerous and does no good, the profession would forgive him had he omitted its description.

Chapters twenty-one and twenty-two, *Granular and Cystic Degeneration of the Cervix Uteri*, and *Syphilitic Ulcer of the Cervix*, present no addition except a few minor ones in the first. *Uterine Fungosities* is the subject of the twenty-third, an entirely new, chapter; it is brief, but is really one of the most valuable in the book. Then follows another new chapter occupied with *Laceration of the Cervix*. This lesion, which in

¹ Du Kleisis Génital.

the fourth edition was dismissed with a few lines, is now considered in several pages. Dr. Thomas gives Dr. Emmet all praise for first recognizing the importance of this condition, and devising the means for remedying it, and states that his teaching in this regard "constitutes one of the most important contributions to gynecology ever made."

It seems to us somewhat remarkable that attention has not been called to the following passage in the writings of Paulus Ægineta: "Fissures occur about the mouth of the uterus from difficult parturition, and at first they escape notice while the pains from labour are recent, but afterwards they are slightly felt, either upon manual inspection or during coition, when they bleed owing to the friction. They are also discovered when the vagina is distended, for ruptures in the circle of the mouth are perceived."

How frequently are these lesions the source of discomfort, disease, and require treatment? It is startling to be told that one woman in six that have borne children and who have uterine disease, has a lacerated cervix (Goodell), and still more that one-half of the ailments among those who have borne children are to be attributed to lacerations of the cervix (Emmet). We dare not question the accuracy of two such able and conscientious observers, whose opportunities have been so great. Mr. Massey, in "Adam Bede," says, "I tell you there is not a thing under the sun that needs to be done at all, but what a man can do better than a woman, unless it is bearing children, and they do that in a poor make-shift way: it ha' better been left to the men." The last statement men would probably demur to, but the one before it, that women bear children in a poor make-shift way, surely has some truth in it, if the process is so commonly followed by an injurious laceration of the cervix. Or else obstetric practice is very far from being what it ought to be, and there is an urgent demand for reform and improvement.

But, however produced, it is fortunate that Dr. Emmet has demonstrated a certain method of cure, and hundreds of women have been relieved by him and others guided by his original knowledge. We wish we could write "always safe" conjoined with certain, but facts forbid; already the reviewer knows of two fatal cases following this operation, one occurring in his own practice. An operator therefore should never assert, as some have, that there is no danger in the operation. Dr. Thomas's description of the operation and illustrations are all that could be desired.

Is it not possible that the frequency of the lesion and the necessity for the operation may by some be exaggerated? May not cervices be needlessly stitched, as for a while they were needlessly, in many cases, slit? One of the ablest and most brilliant of London medical journalists recently wrote as follows in the *Louisville Medical News*:—

"When Dr. Sims was first here he demonstrated to the satisfaction of a great many people, and indeed seemed almost to have established it as a course in practice, that a great number of women are suffering from complaints which require that the cervix uteri shall be lacerated to the extent of complete division; and we were under the impression that, according to the well-established experience of Marion Sims and his school, about twenty to twenty-five per cent. of the gynecological patients are required to have the cervix uteri divided in order to be restored to health. But if now we find that at least as many are suffering from complaints which require that cracks, cuts, and fissures of the cervix shall be shut up, it seems as if the greater part of the energies of that most fearfully numerous, highly intelligent, and active class of practitioners who, either as specialists or as family doctors, have a claim to the title of gynecologists, will in future be divided

between splitting up the cervixes of those women who yet possess them entire, or uniting with horse-hair or silver wire those which are by nature crushed or fissured."

Behind this correspondent's pleasantry there is an element of truth, and it will be well enough for the select circle of gynecologists occasionally to listen to the voices of the outside world of medicine, though in the quotation given the final statement seems as paradoxical as the advice of a character in "Endymion" as to having "a principle which will carry you through everything;" "you must show that democracy is aristocracy in disguise; and that aristocracy is democracy in disguise. It will carry you through everything."

Commencing on page 363, are five chapters occupying more than one hundred pages, devoted to uterine displacements. We find many additions in the text and several new illustrations, among the latter some new pessaries—fresh devices to keep in place that errant organ the uterus—not so errant, indeed, as the old physicians taught when it wandered, at its own sweet will, in every part of the body—but with its fallings and flexions, its turnings and torsions still errant enough to tax, for a good while to come, the mechanical ingenuity of doctors eager to add to the hundreds of pessaries already made. While Dr. Thomas is an ardent advocate of pessaries, he is very far from the ultraism of those for whom uterine displacements are the alpha and omega of uterine pathology.

On p. 470, Dr. Thomas credits Hippocrates with saying *Propter uterum mulier est*. The expression should be *Propter uterum mulier condita*, while Van Helmont's was *Propter solum uterum mulier est quod est*—a quotation which better suits the connection than the true one of Hippocrates.

The chapters upon *Periuterine Cellulitis*, *Pelvic Peritonitis*, *Pelvic Abscess*, and *Pelvic Hematocele*, are almost the same as the corresponding chapters in the fourth edition. The definition of hematocele, "an accumulation of blood in the pelvic cavity either above or below the peritoneum," we still believe an error. The collection of blood must be intraperitoneal and encysted; outside of the peritoneum such collection is a hematoma.

Fibroid Tumours of the Uterus are considered in the thirty-fourth chapter. This chapter is much longer than in the fourth edition, and contains very important additions, not the least valuable of which is a description with an illustration of Thomas's *spoon-saw*. The utility of this instrument is greater than any one who has never used it can imagine. The removal of fibroids by abdominal section is considered, and three methods, viz., Péan's, Schroeder's, and Thomas's, are successively presented. Dr. Thomas states that he has removed the uterus in whole or great part, on account of tumours, seven times, with three deaths and four recoveries.

The thirty-fifth chapter, *Uterine Fibro-cysts*, is almost unchanged from the thirty-second chapter of the fourth edition. *Uterine Polypi* are considered in the thirty-sixth chapter. The author does not mention hot water injections to check the hemorrhage caused by a polypus; we know from experience that such injections sometimes prove very efficient, and certainly we have more faith in them than in the gallic acid or elixir of vitriol, recommended by Dr. Thomas, or any possible astringent administered by the mouth. That astringents thus given control uterine hemorrhage is an assertion which has, borrowing an expression from Disraeli, all the organic weakness of tradition. In regard to instruments for the

removal of intra-uterine polypi, we would be glad had Dr. Thomas referred to a most ingenious one devised by Dr. Eugene Hubert, and presented by him to the *Congrès International* of 1875. It seems to us one of the best instruments ever devised for this purpose.

In the thirty-seventh chapter *Sarcoma* is considered, and also *Adenoma*, otherwise the chapter is scarcely altered from the thirty-fourth of the fourth edition.

The next chapter is upon *Cancer of the Uterus*, and contains several additions, the longest of them being a description of Freund's operation for extirpation of the uterus. In referring to the etiology of uterine cancer, Dr. Thomas states that his experience goes strongly to sustain the opinion of Breisky, Emmet, and others, that epithelioma of the cervix very generally engrafts itself upon a laceration—a very strong argument in favour of the early performance of Emmet's operation.

Uterine Moles is the subject of the thirty-ninth chapter—text and illustrations unchanged from the fourth edition. Really, we question the fitness of having the subject of this chapter considered in a work on diseases of women, for it belongs to obstetrics, and is always treated by obstetric authors. It seems very much like poaching upon the province of the obstetrician, and ought he not to warn the gynecologist off? If the latter takes moles now, who knows but by and by he may claim all the disorders of pregnancy from abortion to varicose veins, disturbance of brain or bladder, of stomach or bowels, etc., until the obstetrician's empire is strictly limited to the lying-in room.

But the chapter is here, and a remark or two in regard to some statements would seem called for. As to the so-called hydatidiform degeneration of the placenta, ought it not to be said that this degeneration sometimes affects only a portion of the organ so that the development of the fœtus goes on and a living child may be born? Again, it is asserted that the villi of the chorion undergo a kind of dropsical swelling. This is the theory of dropsy of the vesicles. But is it not now held by some of the best observers, such as Virchow, Cornil and Ranvier, and de Sinéty, that the disease is hypertrophy of the mucous tissue of the villousities? The fluid in them contains mucine, and the vesicular mole has the general characters of a myxoma. Thus we learn from the recent French edition of Naegele and Gensser, from Spiegelberg's *Lehrbuch*, and from Deschamps's thesis.¹

The chapter on *Dysmenorrhea* contains several brief additions, scattered in various parts of the text. The succeeding one, *Menorrhagia* and *Metrorrhagia*, is the same, save as to a few minor matters, as in the fourth edition. The concluding paragraph is as follows:—

“I feel very sure that in menorrhagia a great deal of harm results from the frequent use of iron and quinine. These drugs are given to repair the damage done to the blood, but both of them increase uterine congestion, and tend to aggravate the flow.”

Dr. Thomas surely does not intend to forbid the use of quinia in anti-periodic doses when the hemorrhage is distinctly intermittent or remittent? Indeed, in some cases of continuous hemorrhage this agent is one of the most efficient remedies.

In the forty-second chapter, *Amenorrhœa*, the following statement is made:—

¹ Des Alterations des villosities choriales, Paris, 1880.

"In accordance with a law of nature, which we recognize in its effects, but cannot explain, once in every twenty-eight days one or more ovules in each ovary burst their envelopes, etc. But do the ovules burst the ovisacs? And is the rule one or more in each ovary? An affirmative to the first question would demand of the ovule, so minute with reference to the Graafian vesicle, an extraordinary power. An affirmative to the second, would suggest a needless expenditure of ova, and assert that which post-mortem examinations of pregnant or of menstruating women have seldom shown; moreover, were the statements true multiple pregnancies would be the rule, rather than the exception."

The forty-third chapter is upon *Uterine Leucorrhœa*. Dr. Thomas has added to the list of causes of this disorder, ulceration with eversion of the cervix, being, of course, one of the additions. So, too, some material additions have been made in the treatment.

The forty-fourth chapter, *Sterility*, is the old story with the exception of the closing paragraph. Dr. Thomas states that sterility implies an incapacity for conception, and is synonymously entitled barrenness and infecundity. But two pages further the definition is contradicted in these words: "Menorrhagia and metrorrhagia may result in the washing away of the ovum after impregnation, and before fixation." Surely there is no incapacity for conception when a woman can have an impregnated ovum! M. Monod justly remarks: "In a clinical view we must say a woman is sterile who cannot have children."¹ Thus it will be seen that a woman may be fecundated, have the capacity for conception, and conceive, and yet be sterile, because always aborting.

Diseases of the Ovaries commence with the forty-sixth, and end with the forty-ninth chapter, occupying about one hundred pages. Every one of these included chapters, almost every one of the included pages, bears marks of careful revision. But there are two notable exceptions. On pp. 711, 712, we read "during the past eighteen months three cases of pregnancy at full term have been referred to me as ovarian cysts, and this not by ignorant men, but by very capable practitioners." And precisely the same statement was made on p. 695 of the fourth edition. Surely we have here extraordinary coincidences or slight carelessness! Again, a few lines further on the "placental bruit" is referred to as one of the diagnostic signs of pregnancy. Possibly Dr. Thomas failed to read the following passage in Professor Pajot's² very complimentary review of the French translation of his work: "On est étonné de trouver dans le diagnostic différentiel des *kystes* et de la *grossesse*, la mention du *souffle placentaire*! Comment se fait-il qu'après les travaux français de ces trente dernières années on en soit encore la en Amérique."

In the very full and excellent account of abdominal ovariectomy, dividing the pedicle by Paquelin's thermo-cautery is not mentioned, and yet it is one of the best of methods. Dr. Thomas insists upon, very justly we think, all antiseptic precautions in ovariectomy; he is also an earnest advocate of the fever-cot to facilitate the application of cold water for the reduction of dangerously high temperatures occurring in patients after the operation.

Oöphorectomy, or Battey's operation, is the subject of the fiftieth, a new chapter. Summing up his opinions upon this operation, it may be stated, Dr. Thomas believes it will survive all opposition; that it is attended by grave dangers and doubtful benefits; that it is more difficult and danger-

¹ De la Stérilité chez la Femme. Paris, 1880.

² Annales de Gynécologie. March, 1880.

ous than ovariectomy, and requires more surgical skill ; that it is of doubtful benefit in large uterine fibroids.

The subject of the fifty-second chapter is *Extra-Uterine Pregnancy*. This is one of the ablest and most interesting chapters in the book, and, by the way, an entirely new one. With a master hand Dr. Thomas has condensed into a dozen pages the best knowledge upon the subject of extra-uterine pregnancy. Having had an unusually large experience in this condition, and having met with extraordinary success in his practice, much more than ordinary value is to be attached to his utterances. So valuable, indeed, do we rate the lessons of his experience that we are almost reconciled to this invasion of the department of the obstetrician. Let us present his reasons for giving a chapter upon this subject :—

“It may even be thought that this subject is out of place in a work upon gynecology, and that it should have been left for one devoted to obstetrics. Its admission here is proof of the fact that I do not share this feeling. Ectopic gestation, although theoretically falling in the domain of the obstetrician, in reality almost always claims the attention of the gynecologist, from the fact that the existence of pregnancy is in these cases very generally not recognized, the patient being supposed to suffer from some pelvic tumour or obscure uterine or ovarian disorder. It is very frequently necessary to differentiate it from a variety of uterine disorders which will soon be mentioned, and even its treatment involves rather a familiarity with the resources of gynecology than with those of obstetrics.”

We answer, first, the subject is usually treated, often very fully, in works upon obstetrics ; second, uterine pregnancy must be differentiated from certain diseases of the internal sexual organs, or of the pelvic or abdominal cavity, therefore pregnancy belongs to gynecology ; third, as abdominal section is equally required in some cases of intra- as well as some of extra-uterine pregnancy, therefore the Cæsarean operation belongs to gynecology and not to obstetrics. We thus fail to see the force of Dr. Thomas's reasoning, but let us repeat, we are very glad to have his chapter on extra-uterine pregnancy ; it is needed, and no one could write one better than or as good as this. Furthermore, the very elaborate¹ paper by Dr. Bandl, issued in 1879, in the fifth part of Billroth's *Handbuch der Frauenkrankheiten*, proves that Dr. Thomas is not alone in holding that extra-uterine pregnancy is an appropriate subject for a treatise on gynecology. So, too, prior to this, Dr. Barnes, in his well-known work on diseases of women, had also presented the subject.

Dr. Thomas simplifies the practical study of ectopic gestation by reducing these cases to three varieties, viz., tubal, interstitial, and abdominal.

In regard to interstitial pregnancy, Dr. Thomas states that it is much less dangerous than tubal, and more likely to advance to full term. But Hecker² asserts that such pregnancy rarely reaches the fourth month. Then take Baart de la Faille's statistics of interstitial pregnancy, as quoted by Bandl, *op. cit.*, out of seventeen cases only three lasted more than sixteen weeks. In the report given by Dr. Thomas³ of Hecker's cases of tubal pregnancy, contrasted with the preceding statement, there is hardly a sufficient basis for the assertion of less danger in the interstitial variety, nor is it sustained by a quotation that we will give in a moment or two from Spiegelberg.

¹ Die Extrauterin-Schwangerschaft.

² Des divers modes et terminations des grossesses extra-utérines et de leur traitement. Par Benjamin Deschamps, Paris, 1880.

³ A slight error occurs in quoting Hecker's cases. It is stated that “in twenty-six cases rupture occurred in the first month ;” it should read in the first two months.

Dr. Thomas gives a table of seventeen¹ cases of which he has seen the results, being ten recoveries and seven deaths. He gives clear statements as to when and how arrest of the pregnancy in the early months is to be effected, and as to the performance in certain cases of elytrotomy and of laparotomy in others. Among the means for arresting the growth of the embryo, no reference is made to electric shocks, originally successfully used in such cases by Bachetti in 1857, and which Spiegelberg rejects, and electro-puncture, which he asserts does good chiefly by the puncture. Considering the great difficulty of recognizing these cases in the early months, Spiegelberg remarks, *op. cit.*: "The certain diagnosis in the first three or four months belongs almost to the impossible; comparatively few of the entire number will be subjected to treatment. But the pregnancy goes on past the usual period of rupture in tubal and interstitial, and is therefore almost certainly abdominal." Dr. Thomas advises waiting until the effort at labour occurs, and then laparotomy. Velpeau held that the operation should be performed earlier, that is, when the foetus was viable, avoiding thus a possible rupture of the sac in the last months of pregnancy. Depaul, Charpentier, and Frankel advise operating about the end of the eighth month.

In regard to what has been termed the *secondary* operation—that made at or near the completion of pregnancy being known as the *primary*—an operation made after the gestation period has passed and the child is dead, Dr. Thomas advises waiting until constitutional disturbances occur.

He concludes this most interesting chapter with the following wise words:—

"Abdominal surgery is too progressive, too steadily advancing, to admit of the application to it of the maxim, 'there is no better way of judging of the future than by the past.' What was reprehensible in abdominal surgery five years ago has become safe and practicable to-day, and it is almost certain that the near future will see cases of laparotomy successfully performed for the cataclysmic symptoms resulting from the rupture of the extra-uterine foetal cysts. So sure am I of this, that I would now assume laparotomy to be the only legitimate resource in these cases where sufficient delay has been practised to convince the practitioner that death is surely approaching."

The final chapter is upon *Chlorosis*, and is the same as previously given, the suggestion of dialyzed iron being the only addition.

We have now completed our review of this admirable work, a work which is at once a marked representative of American medicine, and reflects the highest honour upon its distinguished author. As we have asserted in past years, still more earnestly do we now assert, it is the best book in the English language upon diseases of women. T. P.

ART. XXII. — *Medico-Chirurgical Transactions*. Published by the Royal Medical and Chirurgical Society of London. Vol. LXIII. 8vo. pp. lxxvi., 362. London: Longmans, Green, Reader, and Dyer, 1880.

THE present volume of the "*Medico-Chirurgical Transactions*" contains twenty papers. Of these, nine have already been noticed either in this

¹ Deschamps, referring to one of the cases appearing in this list, the one numbered 14, remarks: On peut toujours émettre un doute sur l'exactitude du diagnostic. A similar opinion was expressed in one of the French journals at the time the case was published, and also in one of our American journals.

Journal or in the *Medical News and Abstract* during the year, as they have appeared in print in the Proceedings of the Royal Medical and Chirurgical Society. Of these, therefore, it is not necessary to give any abstracts, and we shall lay before our readers notices of only the remaining eleven papers.

The first two deal with abnormal developments in men, the first of a *Large Dermoid Cyst found in the Abdomen of a Man*, by WM. MILLER ORD, M.D., and CHAS. BRODIE SEWELL, M.D., and the second of *Malformations of the Genital Organs of a Man associated with persistence of one of the Ducts of Müller*, also by Dr. ORD. Dr. Sewell's patient was a man, æt. 28, "greatly given to hunting," who, on being annoyed only by a boil on the buttock, sent for Dr. Sewell. Struck with the disproportion between the trivial disease and the apparent gravity of the illness, Dr. S. examined him carefully and found fixed abdominal dulness, the result of a fluid, the recti muscles widely separated, dyspnoea and a displaced liver, all of which the patient had attributed merely to increasing stoutness. A trocar was inserted and two pints of fluid, like pea soup, were drawn off. This speedily solidified into a pomatum-like mass, showing hairs and soft epithelial scales in the microscope, but neither hydatid hooklets nor crystals. Within three hours peritonitis set in, and he died on the fifth day. The *post-mortem* showed a large cyst filling a great part of the abdomen, and itself filled with rancid pulpy fat and abundance of hairs, and weighing fourteen and one-half pounds. The contents, although the odour suggested the presence of sweat, contained no butyric acid or sweat products, but were almost absolutely pure fat. The cyst lay behind the peritoneum in close structural relation to the bladder and rectum. After referring to a few similar cases, the authors discuss the possible origin. Rejecting "developmental inclusion," which would require it to hold some relation to the skin and abdominal walls, they hesitate between "foetal inclusion" and "aberrant development," inclining rather to the latter, founded upon consideration of corresponding ovarian tumours—certainly the most reasonable conclusion.

The second case was under Dr. Ord's care, not in consultation, but in St. Thomas's Hospital, where he died of tubercle. The right testis had never descended lower than the groin, where it was shut off from the abdominal cavity. A large tube (shown in an accompanying drawing) of the calibre of the intestine and distinct from the ureter, was found to extend from the upper part of the kidney to the neck of the bladder. It was probably a surviving duct of Müller.

Mr. HENRY MORRIS contributes an interesting paper on *Two Cases of Carcinoma of the Breast preceded by so-called Eczema of the Nipple and Areola*. In *St. Bartholomew's Hospital Reports* for 1874, Sir James Paget first called attention prominently to the connection of these two disorders—a connection, Mr. Morris thinks, as yet not observed, except in London. Six months before Mr. Morris's paper was written, however, Dr. S. W. Gross presented a similar case to the Pathological Society of Philadelphia (see *Phila. Med. Times*, July 5, 1879, p. 486), and the case was the more remarkable in that it was in the breast of a man. Dr. Gross states also, that he has seen one other such case (*Tumours of the Mammary Gland*, p. 28). Busch, of Bonn, also, in 1877, reported some analogous, but not identical, cases.

The first case was that of a needle-woman, aged forty, who in fifteen years had had seven children and two miscarriages. The youngest child

was two years old. For six years the left nipple had been sore, commencing as a blister, which became red and moist, and gradually melted away, leaving a hole surrounded by a weeping eczematous areola. This remained stationary till just about the time she weaned her last child five or six months before, when it began to enlarge. There was some ill-defined hardness of the breast and an enlarged axillary gland. In August, 1876, the breast and the gland were both removed. In August, 1877, she was delivered of a healthy child. The catamenia had disappeared for eight months before the operation, but returned after it. In October, she was taken ill and died in February, 1878, with disseminated abdominal cancer.

In the second case, a woman, æt. 33, came to the hospital for a small phlegmon over the third left costal cartilage. To her surprise, Mr. Morris paid far more attention to the condition of the left areola than to the phlegmon. She said the nipple had been sore for four or five years, beginning as a scale on a moist surface, which formed and fell again and again, while the nipple gradually flattened and finally came away as a core, the superficial eczema still spreading. Two small nodules connected by a tract of condensed tissue existed in the breast, and one of the axillary glands had been enlarged for eight or nine months. March 1, 1879, the breast was removed, the axillary gland being left; a mistake, which was corrected thirty days after by a second operation, when a later developed cluster of these glands were removed. May 23, she died of broncho-pneumonia. The lungs, liver, kidneys, and other organs were cancerous.

It will be of interest to surgeons to note that in the cancer out-patient department of one London hospital (the Middlesex), from 1872 to 1878 inclusive, Mr. Morris should see such a large number as 305 cases of mammary cancer and 280 in other parts of the body.

Two cases of *Direct Dislocation backwards of the Femur with Fracture of the Rim of the Acetabulum*, are related by Mr. F. S. EVE with good drawings of each. In one of them the head of the femur was above, and in the other below the tendon of the obturator internus. A table of all similar specimens in the London museums is appended, and the cases are carefully analyzed. It is by just such careful work as this that step by step the science of surgery is perfected in details, both of diagnosis and treatment.

Dr. H. VANDYKE CARTER, of Bombay, follows with a paper of seventy pages on the *Experimental Pathology of Spirillum Fever*, or Relapsing Fever. There were forty-four experiments done in inoculating the disease from the monkey and man, chiefly to the monkey. Most of the experiments were successful, and the author seems to have done very careful and excellent work. Those interested in the subject are referred to the original paper.

That most observers should believe that molluscum contagiosum is a disease of the sebaceous glands is justified, not only by the gross appearances, but not a little by microscopical sections. In an article on the *Non-Glandular Theory of Origin of Molluscum Contagiosum*, Mr. ALFRED SANGSTER presents strong reasons for the opposite side of the question. Even here, however, the sections are not entirely decisive.

One of the most interesting of the papers in the volume is by Mr. LAWSON TAIT, on *The Antiseptic Theory Tested by the Statistics of One Hundred Cases of Successful Ovariectomy*. At the outset he avows himself a thorough convert to the germ theory, but calls attention to one very impor-

tant fact, hitherto, as a rule, forgotten, in the argument, namely, that while germs will inevitably produce putrefaction in certain infusions, etc., these fluids are all *dead*, and that were germs to possess in *living* fluids the power often imputed to them, surgery would have been long ago an extinct art, since no operation could have been successful until the days of antiseptics. Even a slight cut would undergo putrefaction, or, to borrow Dr. Roberts's excellent illustration, even the needle of a hypodermic syringe would inevitably poison the wound, a line of argument which disproves all by proving too much.

Statistics, to be valuable, must include operations and operative methods, as far as possible, similar, or, better still, identical, and operations of such magnitude that germs would have an acknowledged influence, not to be neutralized by the process of resistance on the part of the patient. For instance, Mr. Wells's increased success with antiseptics, though true as a fact may be fallacious as an argument, for just about the same time he introduced the intra-peritoneal method with the pedicle, thus making an important change in his operative method. Mr. Tait's own cases, in this respect, are of very great value, for while in 26 cases using the clamp with antiseptic precautions, and in 36 cases without antiseptics, he had, respectively, 27 and 25 per cent. of deaths; in 17 cases of the ligature, without antiseptics, he reached a mortality of only 5.9 per cent.; and in 29 cases, with antiseptics, of only 3.45 per cent.—a result which, when placed alongside of those of Mr. Wells, and especially of Mr. Keith, ought surely to set at rest the question of the pedicle. The difference of the last two sets of cases he sets down to an increasing personal experience and skill.

In order to test the value of antiseptics he constructed, from the cases similarly grouped by methods of treatment, what may be called average curves of the pulse and the temperature, *i. e.*, for each morning, and each even of the first ten days, he took the various pulse and temperature readings of all the cases in the group and noted the average. Uniting these average readings gave him the average curves. One important general result he calls attention to, *viz.*, that the temperature curve is less reliable, as a rule, than the pulse curve—a result not to be overlooked in these days, when the thermometer threatens to become a clinical autocrat. The temperature rises not infrequently explosively, the exaltation being without cause, and lasting, it may be, but two or three hours, but the pulse is much more equable, and corresponds to the general and not the local condition of the patient. Especially is this true of the most critical night—the fourth—when, although the temperature will inevitably rise, no fears need be aroused if the pulse be not much disturbed. The tables of pulse and temperature curves are eleven in number, grouping the cases as treated by the extra- and intra-peritoneal methods, with or without antiseptic precautions, etc. The general result may be said to be decidedly in favour of the intra-peritoneal method, but to leave the value of antiseptics at least in doubt—a result that we must confess is a surprise. Mr. Tait's method is just and fair, for it is founded on a physical basis which gives common ground for all cases to stand upon, and thus commends itself to every impartial man. When it has been applied to a sufficient number of cases it will be one of the most valuable clinical contributions to the antiseptic question that has been made. That the end is not yet any one will readily be convinced on reading the January English journals, in which further statistics are given, but none to our mind so accurate and scientific in

method as those of Mr. Tait. Meantime his conclusion is equally judicious "that he will continue to use all antiseptic precautions until a wider experience decides whether they may not all be given up." And again, that the antiseptic system has taught him the lesson "that there is no detail in the performance of an ovariectomy, or in the preparation for it, so insignificant that it may be intrusted to a deputy, and there is no circumstance so unimportant that a neglect of it may not lead to an important result."

Dr. EDW. C. ANDERSON communicates a short, but very valuable, paper on the *Partial Metabolism by the Liver of Leucin and Tyrosin into Urea*. Usually the presence of leucin and tyrosin has been regarded as diagnostic of acute yellow atrophy of the liver, or of its concurrent atrophy in typhus, smallpox, and some other exanthemata. Having discovered their presence and subsequent disappearance in a case of jaundice with recovery, Dr. A. made over 500 analyses within two years, and has proved their presence in 33 cases, in some of which the liver and spleen were diseased; in others there were cardiac disease, rheumatism, phthisis, pneumonia, bronchitis, and other maladies.

Messrs. ALFRED WILLET and WM. J. WALSHAM follow with a very full account of a remarkable *Congenital Malformation of the Spinal Column, Bony Thorax, and Left Scapular Arch in the Body of a Woman*. The dorsal spine had, if anything, a slight anterior curve with a left lateral curve, four and a half of the dorsal vertebræ were missing, five ribs on the right side and four on the left were missing, the left clavicle was deformed, and, most curiously of all, the scapula, itself much deformed, was connected to the sixth cervical vertebra by a broad bridge of bone. The muscles and vessels are described, and similar bony malformations hitherto undescribed are carefully compared with the present specimen. The authors regard the spinal and costal malformations as due, not to irregular ossification, but to an earlier defect in the development of the mesoblastic element constituting the vertebral and lateral plates of the embryo. The explanation of the unique malformation of the scapula, to which they incline, is, that it is a scapular element, an overgrowth of the normal epiphysis of the posterior border, to which there is no analogy in the lower animals until we reach the placoid fishes.

Mr. FRED. JAMES GANT relates a very instructive case of *Compound Fracture of the Femur Twenty Years after Excision of the Knee-Joint for Disease, the Line of Fracture being transversely one inch above the Bony Union*. For the details the reader is referred to the paper.

As a fit sequel to his opening paper on Cancer following Eczema of the Nipple, Mr. HENRY MORRIS relates a *Case of Epithelioma of the Neck following Chronic Skin Disease*. The patient, a woman æt. 60, had had for nine years a probable eczema, or, at least, some similar form of skin disease on the right side of the neck. A blow caused some irritation, for which caustics were used, and in a few weeks a distinct epithelioma was developed. A firm bronchocele had displaced the carotid to the posterior border of the sterno-mastoids; a fact which had deterred some surgeons from operating. But Mr. Morris adopted an ingenious method of showing the want of connection between the tumour and the artery. Placing the patient on her back, she was told to lift the head. The attempted movement being resisted, the sterno-mastoid lifted the tumour free from the artery. The tumour was removed in September, 1876, the external jugular vein being tied. In March, 1878, she returned and had the growth

removed a second time. During this operation the internal jugular gave way, its walls being involved and softened, and was tied above and below. The recovery was good, and in July, 1880, she was known to be alive and well.

Mr. Morris then discusses the subject of the ligation of large veins, like the jugular, and quotes at length from Dr. S. W. Gross's article (see the numbers of the *American Journal of the Medical Sciences* for January and April, 1867). His conclusion is in favour, at least in the neck, of the simple deligation of the vein, without simultaneous occlusion of the corresponding artery, as proposed by Langenbeck. The origin of the cancer from the long-continued irritation of the skin is another, and a very strong argument for the local origin of such malignant growths, an opinion, we judge, which every year is making more probable and more widely believed.

W. W. K.

ART. XXIII.—*Observations on the Cæsarean Section, Craniotomy, and other Obstetric Operations, with Cases.* By THOMAS RADFORD, M.D., F.R.C.P.Edin., F.R.C.S.Eng., etc., Honorary Consulting Physician to St. Mary's Hospital, Manchester, Eng., etc. Second edition. 8vo. pp. 225. London: J. & A. Churchill, 1880.

THE first edition of this work appeared in a pamphlet of 68 pages, with an appendix and set of plates nearly doubling its text and capacity, in 1865. "Further Observations," in a supplementary paper of 21 pages, were published in 1868. These constitute together a small volume of 152 pages. The first part of this edition contains a tabular record of 77 Cæsarean cases; and the second, 21, making 98 for the whole. In the work under review, the author has added 34 additional cases, bringing up the list to 132; to which the reviewer will add two more, one of them successful, making in all 134; with 24 recoveries and 110 deaths.

Manchester has for a century been at times either the battle-ground between the Cæsareanists and craniotomists, or the position of defence for the advocates of the Cæsarean operation as one of election. This has arisen, in a measure, from the early advocacy of Hull, and from the fact, that in this section of Great Britain, the necessity for one or the other mode of delivery, has so often presented itself to the accoucheur. Dr. Radford has been a firm believer, for many years, in the moral necessity for the elective preference that should influence the obstetrician in deciding in favour of gastro-hysterotomy as against infantile destruction; and at the age of 87 he has again assumed the task of defending the Cæsarean section against craniotomy, cephalotripsy, and the various destructive measures for mutilating and extracting the fœtus. Sixty-one years ago, when a young practitioner of 26 years of age, Dr. Radford assisted Mr. Morris in his first Cæsarean experience; since which time he has once operated and four times assisted as accoucheur, making in all six cases, saving two women and three children: the last case was in November, 1851. He has also been a witness to other cases, one in 1867.

Owing to the age of the author, he has not attempted to rearrange his tables in the introduction of new cases; or to do this with his text, which is somewhat confusing to the reader. The former are in three parts, covering chronologically much of the same periods. The analyses of the

three tables are also separate, and the reader is obliged to add them together. We shall therefore treat the tables as one collection of 134 cases.

In general terms, the causes of dystocia arose from malacosteon in 56 cases, rickets in 32, exostosis in 6, malignant tumours in 15, non-malignant in 8, pelvic deformities from fracture, dwarfed growth, etc., in 10, hydatid cyst in 1, not stated in 5, puncture in ovariectomy in 1, = 134. Of these cases, there recovered after malacosteon 6, rickets 6, exostosis 4, malignant diseases of cervix 4, disease of spine and hip-joint 1, deformed pelvis from fracture 1, puncture of uterus in ovariectomy 1, and not stated 1, = 24. Seventy-eight children were removed alive.

The time in labour of the 24 women saved was as follows: "*early*," one; 12 to 14 hours, one; 18 hours, two; 23 hours, one; 24 hours, two; 30 hours, one; 34 hours, one; 35 hours, one; slight pains for 2 days, two; ditto for 2 or 3 days, with membranes ruptured a few hours, one; ditto with membranes ruptured 12 hours, one; labour 60 hours, one; 4 days, one; 5 days, one; 6 days, one; 12 days, one; not begun, two; and time not stated, three.

Operations on the first day of labour.—Duration 2 hours to 12, eighteen cases with but one saved; 12 hours to 24, eighteen cases with six recoveries. *Operations on the second day* 22, with three saved; *on the third day* 13, with three recoveries; *on the fourth day* 8, all fatal.

Compare this, with the results in our own country, and we find 8 saved out of 11 in operations after labours of 2 to 12 hours. In addition to this, there are cases not timed definitely, but noted as "*early*," "*in a few hours*," etc., amounting to 12, with 7 recoveries. *Operations on the second day* (U. S.) 19, with 6 saved; *on the third day* 18, with 10 saved. The improved proportion is accounted for, by the fact, that this only represents the cases noted in days or hours; there having been a large number of protracted labours not timed, which proved fatal as a general rule after the operation. *On the fourth day* 15 operations with 2 saved. The effect of delay is well shown by the operations on rachitic dwarfs. On the first day of labour 9, saving 5; on the second day 7, saving 2; on the third day 1, lost; and on the fourth day 5, all lost.

Dr. Radford is fully impressed with the importance of operating early, although forced to admit that very early sections have been highly discouraging in his own country. There appears to be a very marked difference in this respect in our two countries. We have attempted to account for this in a former paper, attributing it to the climate, poverty, previous or present disease, and in some instances to intemperance. The fact, that nearly one-half of the subjects in Great Britain and Ireland were sufferers from malacosteon, when there was not one in the United States, shows the more healthful influence of our climate and hygienic conditions upon parturient women. Intemperance may perhaps not be as prominent a factor in increasing the mortality of the operation as we had supposed; but it is true that the lower classes of women here, as a rule, drink much less malt liquor and spirits than in England, and that such habits make a bad preparation for surgery. In Dr. Radford's six cases, intemperance was not to blame for the losses by death.

Craniotomy.—Our author takes very decided ground against infantile destructive delivery in all its forms as an elective expedient, and especially in subjects known, from a former delivery by the same process, to be incompetent to bear a living child. He says, page 65:—

"But in a second pregnancy when they [the parents] are fully acquainted that an un mutilated infant cannot be born, the question stands on very different social and moral grounds. The practitioner is here placed in a most responsible and trying position when called upon to decide whether he ought, time after time, or thus repeatedly, be made the agent to take away life. I entertain the fullest conviction that a great proportion of our profession have most conscientious scruples to repeat this revolting operation on the same woman. This destruction of infants, in my humble opinion, can be justified on no principle, and is only sanctioned by the dogma of the schools or by usage. . . . It is by no means to be understood that the life of the infant must never be sacrificed to save the mother; on the contrary, I have already enumerated cases in which craniotomy ought to be performed as an operation of election; but it is not right to destroy the infant on the unfounded assumption that the mother could alone be saved by it; a deduction altogether untrue and unsanctioned by statistical evidence.

"The life of the woman is not, either relatively or comparatively, always of the same value. If she be afflicted with a serious disease, or labouring under some incurable malady, being unfit, or unable to discharge her domestic and her social duties, which performance can alone render her life desirable to herself or to her friends, then, under such circumstances, the infant's life ought not to be sacrificed for the mere ideal chance of prolonging her miserable existence, which is a positive evil to herself."

This ruling of the author applies with special force in his own country where the Cæsarean section has been repeatedly performed on women incurably diseased with malacosteon, cancer, etc., numbering in all sixty-nine cases. In our own land it has but little application so far as our past record would indicate, having had no malacosteon or cancer in any case operated upon.

"When the contingent hazards of craniotomy and the risk of its abuse are considered, and we know that the act is the sacrifice of life, and that this awful catastrophe must be often repeated in order to carry out the abstract proposition 'to save the life of the woman by destroying the infant'—when we remember the difficulty which in extreme cases is experienced in performing it, the cruelty it inflicts, and many other evils consequent upon it—we may truly wonder that professional men should allow their minds to be haunted by an imaginary Cæsarean spectre, and be so obscured in their own moral and social responsibility. Why should the obstetrician stand in such an unenviable position, not only as an accessory, but, *ipso facto*, the agent? Again, I ask, ought he to be called upon, and ought he to consent to victimize poor helpless infants in successive pregnancies, in numbers which make one shudder to recount?" (page 66.)

"Woman naturally is mild, kind, and humane. She is endowed with great fortitude and undoubted courage. She has generally a great desire for offspring, and has a great love for children. Then how can we suppose that any woman with a well-regulated mind, if fully aware of her responsibility, could willingly be a consenting party to the repeated destruction of her unborn infants? According to my own knowledge the case is otherwise. I feel convinced in my own mind that there would scarcely be a woman to be found who would not suffer any amount of bodily pain to save her infant." (page 67.)

We can readily agree with the author upon all these points; but there are two conditions under which the love of offspring and value of the life of an infant very frequently disappear from the heart of a pregnant woman. Grant that she will endure pain and suffering to save her infant; will she be willing to run the risk of four to one, as in England, of losing her own life and leaving the infant behind, in order that it may live? Women in labour are anxious to preserve their children, but maternal love has this element of selfishness, that the mother wishes to live, and enjoy the pleasure of rearing the infant. Look at the numbers of abortions criminally produced; of infanticides of newly born children of shame; of the

practices even of married women to prevent their infants in utero coming to maturity; and we find that the love of offspring fails when the life or fair fame of the mother is very seriously endangered.

Fortunately there are some exceptions, or there would be no *elective* Cæsarean operations. In our own land, where 75 per cent. of early and elective operations are successful, there can be little excuse for a woman declining to endure gastro-hysterotomy, and demanding a repetition of craniotomy, after she has been made aware that if she becomes pregnant she cannot give birth to a living child. It is evident that society needs a moral reformation on the valuation of intra-uterine life, and the rights of the unborn infant to an extra-uterine existence, and opportunity for development. The more we examine into the moral aspect of craniotomy, the more must we become convinced, that a mother with a contracted pelvis has no right to beget children, and then devote them to destruction to save herself; when it is possible by premature delivery, or gastro-hysterotomy, to save both herself and her offspring.

Dr. Radford closes the first part of his volume as follows: "Deep reflection, and a strong sense of humanity, have induced me further to declare that the Cæsarean section should be generally performed as an operation of election; and that craniotomy should be as far as possible abolished, and ought only to be performed as an operation of necessity." (page 72.)

The exceptional cases mentioned are: 1. When the infant is ascertained by the stethoscope to be dead. 2. In rupture of the uterus where the infant is generally lost. 3. In a first labour, with a contracted pelvis, where the fœtus cannot be delivered unimutilated, "and also in those cases in which the mischief has taken place after the woman has naturally borne one or more children." 4. In cases where turning is quite impracticable, as here the infant is almost always dead. 5. In some cases of protracted labour where the pelvic organs have already sustained such injury by pressure, that it would risk the life of the woman to deliver by the forceps; and 6. In extreme hydrocephalus.

We take issue with Dr. Radford on some of these points, as drawn from the experience of our own country. Craniotomy should never be performed after rupture of the uterus, as abdominal section offers a much safer mode of removing the fœtus, and an opportunity to cleanse the abdominal cavity and close up (if required) the uterine rent. In cases of impaction, where turning is impracticable, the Cæsarean section is preferable to embryotomy, as here we have only the interests of the mother to look after, and she is safer under this form of operation, which in America has saved seven cases out of ten. Embryotomy, even by its advocates, is admitted in this condition to be one of the most difficult and dangerous of all obstetric operations.

The Cæsarean operations of the United Kingdom are credited as follows: to England 103, Scotland 21, and Ireland 10, = 134. Lancashire has furnished a large proportion of cases (28), and is only second to London.

Case 97, of the table, the author says stands "quite unique." It is the case of Mr. T. Spencer Wells, in which he perforated the uterus in mistake, in an operation for ovariectomy. In this surmise the author stands in error, as Dr. W. H. Byford, of Chicago, did the same thing in 1878, in the case of an unmarried young lady. Both of these subjects recovered.

Causes of Death.—Unfortunately Dr. Radford's full tabular collection has not been published, and his printed tables give no column on this point. In his text, he gives the cases of peritonitis and exhaustion for the second

and third tables, but not for the first (seventy-seven cases); and there is no summary in the former edition: the combined second and third tables give *exhaustion* 20 deaths, and *peritonitis* 15.

Chloroform.—Dr. Radford objects, decidedly, to anæsthetics by inhalation in gastro-hysterotomy. He says: "Chloroform diminishes the energy of the uterus, and induces relaxation; and, therefore, on this ground its administration is here contra-indicated. Its anæsthetic agency in subduing pain is not to be compared to the dangers which may ensue. . . . Vomiting has taken place in most of the cases in which chloroform had been administered. It has varied in degree: in case 96 it was incessant until the fourth day; the abdominal wound was burst open; a knuckle of intestine was protruded; and fresh sutures were required." (page 109.)

We have especially referred to this subject in a paper prepared ten years ago, and are still more convinced by the additional experience collected, that without anæsthetics the Cæsarean operation has been decidedly less fatal in America than with them, as vomiting and uterine inaction are very much more frequent after chloroform and other anæsthetics have been inhaled. As the incision of the abdomen is particularly painful, and more especially through the skin, local anæsthesia with ether-spray by Richardson's apparatus is all that the operation requires. Care should be taken not to spray the uterus, as the ether acts as an irritant, and excites the organ to violent contraction, interfering with the removal of the fœtus, and endangering laceration. The wound, according to an observation by Dr. Radford, in an operation under Dr. Roberts, of Manchester, in 1867, is inclined to gape open, as shown very decidedly by the autopsy.

Uterine Sutures.—These have been used in about the same number of cases in the United Kingdom and United States, but with much better success here. Dr. Radford formerly opposed the closure of the uterine wound very decidedly, but recent cases ending successfully have influenced him to doubt somewhat the correctness of his first impressions, although he still appears to lean towards his former view. He says: "But as regards the evidence to be obtained on the two sides of the question, it would I think preponderate in favour of their non-employment. Notwithstanding this may be so, yet I think the subject demands further consideration." (page 112.)

Dr. Radford is inclined to favour the long-tailed uninterrupted suture of Mr. Spencer Wells, with the end brought out of the vagina, so that the silk may be removed, when no longer required, by traction. In this country sutures have been used 20 times, with 7 recoveries. Ten of these operations were under silver-wire, and five of them succeeded, the first woman now living, having been sutured in December, 1852. The reviewer has as decided views the other way, and believes with much confidence in the virgin-silver-wire interrupted suture twisted twice, turned down over the line of incision, and cut off below the second twist. With one-half of the cases saved—one woman twice; another after ten days' labour; a fourth case after seven days; and a fifth, forty hours—I think we have reason in America to recommend the method with some degree of satisfaction and confidence. It is now a question for the future to decide, whether it would not be advisable in all cases, early as well as late, to use the wire suture, and secure the uterine wound against the danger of gaping and allowing the exit of lochia. It is very certain that carbolized catgut has proved a complete failure, and never should be used in closing the uterine incision.

Time for Operating.—The author recommends that the operation should

be commenced "as soon as the labour is declared; before or immediately after the membranes are ruptured." Dr. Greenhalgh, who has operated eight times with one success, recommends commencing prior to the full period of gestation, as he has himself done in two instances, both cases of malignant disease, saving one: his reasoning is, that at the completion of the eighth month "the vessels are smaller, the contractile power of the uterus greater, and the liquor amnii relatively in greater proportion to the size of the child." In the event of operating at this period, care should be taken to preserve an open cervix and os for drainage. In 1867, Dr. J. Braxton Hicks operated at 8½ months, at Guy's Hospital, first inducing uterine contractions by the use of ergot a few hours previously; but the patient died. Her death was attributed to closure of the os and escape of fluids into the peritoneal cavity. As in some cases of pelvic collapse the os cannot be felt, and the membranes do not rupture until labour has a long time existed, the time of rupture cannot be regarded as a rule to go by in operating. Labour-pains should not be present more than from two to ten hours in an elective operation, and especially in dwarfed subjects.

Position of the Placenta.—"Its position in sixteen cases was as follows: in eight it was placed anteriorly; in seven of which it was central, in one a little to the left. In eight cases it was fixed on the posterior part of the uterus; in three of which it was centrally situated; in two it was toward the fundus; in one to the left; and in two to the right side." (page 115.)

Before operating, the stethoscope should be used to ascertain by the placental souffle where the placenta is located. One may, however, be deceived in this, as was Dr. Richardson in his Porro-Müller case, the *bruit* being heard more distinctly on the left than the right side; but the incision revealed that it was central in front.¹ In a case like this, the placenta should be rapidly peeled off on one side and the fœtus removed: it ought not to be incised, or entirely peeled off: when ascertainable, the side least covered should be separated. It is believed that such cases are not well adapted for closing by suture, but this may be mainly theoretical, as the suture is far from being as yet fully tested.

The remainder of Dr. Radford's book is taken up with remarks on the various instruments used in reducing the fœtal head, and a record, *in extenso*, of seven Cæsarean cases; with short references to Porro's operation, and laparo-elytrotomy. He quotes Blundell on "*Extirpation of the Puerperal Uterus*,"² and says: "the above quotation with many others contained in Dr. Blundell's observations, point out most clearly that he ought to be strictly considered as the pioneer of abdominal surgery. Porro doubtless based his operation on Blundell's suggestion." (page 223.)

Dr. Radford makes a very natural conclusion here, but it so happens that Prof. Porro did not know of Blundell's experiments until after his own operation; or those of Giuseppe Cavallini,³ of Florence (1768), who preceded him by fifty-four years. Dr. Porro experimented on animals himself, as Cavallini and Blundell did, and applied the knowledge gained by the said experiments in instituting the method which bears his name. The author states that there have been 59 Porro operations. The correct number reported is 65, with 27 recoveries. There were 24, with 9 deaths in 1880.

R. P. H.

¹ See number of this Journal for January, 1881.

² Researches, Physiological and Pathological, p. 27, 1823.

³ Master of Surgery in Santa Maria, Nuova Hospital, of Florence: he experimented on dogs and sheep.

ART. XXIV.—*Clinical Lectures and Cases with Commentaries.* By HENRY THOMPSON, M.D., M.A. Cantab., F.R.C.P. London, Consulting Physician to the Middlesex Hospital. 8vo. pp. x. 197. London: J. & A. Churchill, 1880.

THIS is a collection of clinical lectures and reports of miscellaneous medical cases which have for the most part already been published in the "Transactions of the Clinical Society of London," and the various London journals. The lectures are all interesting and written in very good style; of the two not already published we will only allude to one in which Dr. Thompson, with great frankness, details two fatal cases of ascites in which death was accelerated by paracentesis. They illustrate the fact that although paracentesis is of undoubted value in saving or prolonging life, there is also a dark side to the picture.

The first case shows the familiar picture of dropsy from cirrhosis coming on in an intemperate, syphilitic subject, in this instance complicated by interstitial nephritis. He was tapped on the day of admission, and, it is stated that, although on the next day the abdomen was diminished in size and reduced in tension, there was an increase of œdema in the penis and scrotum; the urine at this time, although loaded with lithates, contained no albumen or blood. The abdomen continued slowly to increase in size until three weeks after the operation, it measured two inches more than upon admission, the urine being occasionally albuminous and only slightly increased in volume, and the patient suffering from cough, nausea, vomiting, and diarrhœa. A second operation was performed and copaiva administered, and although the flow of urine was greatly augmented, fluid accumulated so rapidly in the abdomen as to necessitate in a little over two weeks a third operation.

After this the abdomen rapidly filled, the cough became persistent and troublesome, the urine uniformly albuminous, and the patient extremely feeble. It is stated that at this time the patient seemed "instinctively conscious of an utter inability to bear an operation," and that it was deferred "for many weeks." "At last, after a brief show of amelioration in health and strength, he regained confidence and gave his consent to his own destruction as it proved. Ninety-six ounces of straw-coloured fluid were drawn off, and for a time he experienced a feeling of decided relief and passed a good night; but in the morning a great change is reported. He is now stupid and speechless, he cannot be roused to answer questions, neither can he put out his tongue when asked. He is restless and tosses his limbs about incessantly. On the morning of the 22d, his respirations were hurried and his pulse almost imperceptible; in the afternoon he died." At the autopsy, four pints of fluid were found in the abdominal cavity. In this instance the cause of death was undoubtedly from the draining of albumen, from an already greatly enfeebled subject, and, from the notes of the case, it does not appear that there was any urgent necessity for the operation.

In the second case, although death was also due to the operation, the manner of causation was different.

The patient was habitually intemperate, had suffered for ten years from winter cough, and had had three attacks of rheumatic fever followed by cardiac complication and granular degeneration of the kidney. Two weeks after his admission he had an eruption of purpura, and two days afterwards,

during the persistence of the purpuric eruption, paracentesis was performed. "Over two ounces of pure blood came away first, and then four pints of straw-coloured fluid, the last portion of which was stained with blood." Within twelve hours after the operation he became semi-conscious with stertorous breathing, the abdomen filled with fluid, measuring one-half inch more than before he was tapped, and within twenty-four hours he became comatose and died. At the autopsy, eight pints of dark blood-stained fluid were found in the peritoneal cavity, mixed with a small sediment of black clots; the peritoneum was ecchymosed, liver cirrhotic, kidneys granular and contracted, one containing a large cyst, and the lungs pigmented, œdematous, and engorged.

Better illustrations could not be desired of the danger attending the routine and thoughtless performance of paracentesis for abdominal dropsy, an operation trivial in itself, but one of which we have here two examples of its capability of causing death. In neither instance does there appear to have been any very threatening symptoms from the mere presence of fluid, while the operation was distinctly contraindicated in the first case by the extreme debility of the patient, and in the second by the existence of purpura or hemorrhagic diathesis and advanced kidney and lung disease.

Among the "cases with commentaries," reported by Dr. Thompson, there are only three which have not been previously published.

The first of these is a case of cerebral rheumatism which terminated fatally with the symptoms of collapse, the temperature, the evening before the fatal termination falling to 95.1° .

The next case is one of acute rheumatism with cerebral symptoms and a high degree of pyrexia which was successfully treated with prolonged cold bathing. The aggregate fall of temperature during and immediately after the bath varied from 9.1° to 5.1° , in one instance the body temperature being reduced to 95.4° . The temperature of the bath was never above 90° in the beginning and never below 58° at the end, with one exception when the thermometer stood at 74° at immersion. The damp sheets were allowed to remain around the patient for some time after the bath, this being recommended by Dr. Thompson to prevent the rise which often occurs when the patient is put dry to bed, particularly when he had been well rubbed with flannel.

The last of the three unpublished cases is one of diphtheria in which death was caused by pyæmia and peritonitis. After a moderately severe attack of pharyngeal diphtheria, lasting ten days, and in which no striking departure from the ordinary course of such cases appeared, all the symptoms moderated, the pulse ranging from 84–96 and the temperature remaining at about 99° . This amelioration lasted for a week; towards the end of this period the discharge from the nose, which had never entirely disappeared, became muco-sanguineous and dried in crusts on the right nostril. At the end of this week the temperature rose to 104.2° and the pulse to 126, the throat symptoms increased in severity and death occurred ten days later with all the symptoms of pyæmia and peritonitis.

R. M. S

ART. XXV.—*St. George's Hospital Reports*. Edited by THOMAS TILL-YER WHIPHAM, M.B., F.R.C.P., and THOMAS PICKERING PICK, F.R.C.S. Vol. X. 1879. 8vo. pp. xiv. 662. London: J. & A. Churchill, 1880.

THIS volume contains the usual reports of the various departments of the hospital, some clinical lectures, a memoir of the late Thomas Tatum, F.R.C.S., and eight original articles. The last occupy one hundred and forty pages. It will be more satisfactory to notice first the reports and papers of a medical character, then those having a surgical bearing.

The *Report of the Medical Registrar*, by Dr. OWEN, containing one hundred and twenty pages, is very elaborate, and is remarkable in having appended an index of its contents. He gives tabulated histories of instances of general tuberculosis, aneurism, cerebral hemorrhage, heart disease, and granular kidney, in which autopsies were obtained. These greatly enhance the value of the paper. There are also similar analytical tables of the typhoid fever, chorea, and pneumonia patients. These all show much labor in preparation, but it is to be regretted that the author did not see fit to give the deductions and generalizations to be drawn from the various series. Two striking features in the typhoid table are the frequent presence of albuminuria, which would often be found in other hospitals if more carefully looked for, and the large amounts of alcohol used in the treatment. Twenty-two and thirty-three ounces of brandy a day seem large amounts for even a case of typhoid. However, as the patients who received these quantities recovered, we can only complain of the expensiveness of the cure. There are seven cases of diabetes mellitus spoken of, but in none was there used nitrate of uranium, which, in one case (that of Dr. H. A. Wilson, *Medical Bulletin*, Phila. March, 1880), within our knowledge, seemed to be of great efficacy. An instance of so-called diabetes insipidus in which a trace of sugar was found, was treated, rather ineffectually, by iodide of potassium during ten weeks. The use of ergot in this disease has been attended with sufficient benefit to warrant its use in all cases. An interesting instance of paracentesis of the pericardium is referred to, but no details are given, except that the man, aged sixty-three years, was temporarily relieved and died ten days subsequent to the operation. A more general adoption of this operation will doubtless follow the repeated successes that are found to accompany its performance. An interesting case of aneurism of the anterior communicating artery of the brain is recorded, which should have been studied with special reference to cerebral localization.

The *Reports of the Post-Mortem Department* for 1878 and 1879 by the curator, Dr. WILLIAM EWART, are models of accuracy and full of scientific value. They give statistics of the cases of death, and in many instances furnish the clinical history of the patient as well as the post-mortem appearances. This work is better done than in the average American hospital. The number of autopsies obtained was very great. In 1878 there were three hundred and eighty deaths, of which three hundred and seventeen were examined, while in 1879 there occurred three hundred and sixty-one deaths, in which two hundred and ninety-six post-mortem examinations were made. The classification adopted by the author enables the reader to find with ease the notes of any special disease. Some might take exception perhaps to the position of diabetes, which is placed

under diseases of the urinary organs. Many interesting cases are recorded, a few of which only can be mentioned in this connection. An instance of fatal diphtheritic paralysis will be found on page 250; and under cardiac affections are noted a case of syphilitic deposits in the heart, and a curious case of angina pectoris apparently depending on a torn aortic valve falling against and shutting the orifice of the left coronary artery (p. 264). Other rare conditions are fatal intestinal perforation due to typical albuminuric ulceration (p. 275), abscess behind the peritoneum following fracture of the rib, which had caused puncture of the ascending colon, and probably of the pelvis of the kidney (p. 248), and inflamed dermoid cyst of the cerebellar membranes communicating with a subsegmentary abscess by a normal venous orifice through the skull (p. 288). An instructive account of the case of pericardial tapping, briefly mentioned in the Medical Registrar's Report (p. 91), is given on page 313.

The *Report of the Obstetrical Department*, by Mr. GEO. WALKER, should perhaps be called that of the gynecological department, since it deals with ovarian, uterine, and vulvar affections, and not with pregnancy and labour. Of the three ovariectomies recorded, which were all done antiseptically, two were fatal. In one of the cases, colloid material was found in the peritoneal sac, due to the previous rupture of one of the cysts. A table of twenty-eight cases of bilateral incision for the relief of dysmenorrhœa and other conditions, supposed to be due to stenosis of the external mouth of the uterus, is given. The results are believed by the author to have been satisfactory in most cases.

The *Notes from the Department for the Treatment of Diseases of the Throat*, by Dr. T. WHIPHAM, consist principally of elaborate tables of the cases transferred to the author for the purposes of clinical instruction. The cases of laryngitis from inhalation of dust, from the abuse of alcohol as a beverage, and from unhealthy occupations, are especially instructive. The instances of laryngeal phthisis are numerous, but in no case, I believe, was tracheotomy resorted to as a method of treatment. This operation has recently been quite earnestly advocated as a means of relief by giving rest to the larynx. Tonics, benzoin inhalations, and rhatany lozenges are evidently favourite remedies with the author for the various forms of inflammation of the larynx. All these reports would be much more valuable if there was an attempt at generalization in them. The bare record of cases is of little value to the general profession, and of not much interest to the staff of the hospital itself.

The first medical paper, which is not a mere report of one of the departments of the institution, is that entitled *An Epitome of Fifty Cases of Ichthyosis*, by GEORGE GASKOIN. This contains complete notes of each patient, and is a continuation of the fifty other cases reported in the preceding volume. The author has evidently had in a few years past an extensive opportunity of treating this intractable disease, or deformity as some term it, but does not seem to have had much better success in its management than usual. It is recognized by all as being susceptible merely of temporary relief rather than of cure. He found it to occur about equally in the two sexes, which differs from the experience of some writers who attribute it especially to men. His elaborate study of family histories is interesting; he states that his cases were in one-half the instances hereditary. It is generally considered a congenital affection, but this is not, in his opinion, invariably so; and he supports his belief by cases

in point. The discussion of diagnosis and treatment differs little from that found in the ordinary text-books, except perhaps in the statement that too much washing of the skin may be indulged in as a means of relief. Some cases of the disease do not bear frequent applications of water and too much bathing sometimes tends to aggravate the condition.

Mr. HOWARD BARRETT contributes a good paper, on *Some Cases of Tubercular Meningitis*, in which he refers to the anomalous clinical history of many cases of this form of intra-cranial inflammation. Three cases were members of one family, and the remaining two were brothers belonging to another family. In one instance the patient, a girl of twenty-one years, died suddenly with unusual symptoms, and tubercular meningitis of the vertex and base was found. The greater extent of inflammation was situated in the former region, which makes the case a remarkable one.

The treatment believed to be best was belladonna and iodide of potassium in full doses, with brandy and a simple diet such as milk, cream, and bread. In the opinion of the author the disease may exist without tubercles being actually found at the autopsy. In this he has the support of many authorities, both English and American. The article is written in a scientific, logical manner, and the analysis of cases is excellent. The criticism to be made is the undue length and minuteness of the clinical notes.

The most valuable of all the medical papers is that on *Herpes Gestationis*, by Mr. WYNDHAM COTTLE. He reports a case of this rare disease occurring under his own observation, and also one observed by Drs. Weaver and Hilton Fagge; and then, giving a brief review of the literature of the subject, finishes his masterly article with a page devoted to the conclusions founded on a study of all the recorded cases he has been able to collect. The author shows himself to be keenly sensible of the requirements of a good medical essay, and has committed but one error—the burying of his work in a volume of hospital reports instead of giving it the currency which it would have obtained in one of the prominent medical journals. The article should be read by every one interested in dermatology, and by all those who enjoy good medical writing.

WILLIAM BRUORTON contributes a short account of a *Case of Trismus Infantum*, which was apparently cured through the agency of from one to one and a quarter grain doses of chloral every two hours. This drug is now pretty generally recognized as an agent which gives quite frequently good results in this intractable affection.

The last two articles are by J. HEWETSON BERTOLACCI, on subjects pertaining to diabetes mellitus. One describes a *Modified Method of Quantitatively Estimating Diabetic Sugar by Fehling's Volumetric Solution*, and concludes with the *Description of a New Urine-meter*; the other gives the *Notes of a Case of Diabetes Especially Illustrating the Effects of Codeia, Carbolic Acid, and Salicylic Acid*. The modified method is preferable to the ordinary plan of dropping the diluted urine from the burette into the hot copper solution, because it gives, as the indication of completion, a contrast of colour rather than a fading of colour. The diluted urine is heated, and the Fehling allowed to drop from the burette into the hot urine. This enables the experimenter to tell with more nicety the moment when the sugar has reduced the cupric oxide, and shortens the calculations requisite to determine the amount of sugar per ounce. Any who have laboured through these analyses amid the busy work of a hospital will appreciate the advantages claimed for the modified process.

The new urine-meter is not a urinometer to determine specific gravities, but a graduated vessel with ingenious accessories to measure accurately, rapidly, and in a cleanly way the amount of secretion passed by the patient during the day and night.

The case reported as treated by codeia, carbolic acid, and salicylic acid, during different periods, is instructive as showing the inefficacy of these agents as therapeutic agents; and remarkable in that carbolic acid, given during thirty-three days in increasing doses until nineteen grains three times daily were taken, did not produced distinct toxic effects. The urine on several occasions became a little dark, but no symptoms of annoyance supervened until, just before the drug was omitted, colicky pain was experienced.

We will now notice the surgical portion of this volume. *The Report of the Surgical Registrar*, by WILLIAM H. BENNETT, F.R.C.S., shows that the mortality during 1879 in the surgical wards was 5.37 per cent., including seventeen deaths that occurred within twenty-four hours after admission. These immediate deaths should hardly be included, as they were most probably cases that died from the severity of injury without reference to the hospital or treatment. The paper gives records of the usual run of surgical cases, and concludes with tables of cases of amputation, compound fractures, lithotomy, strangulated hernia, and various operations. These tables and similar ones throughout the volume would be more convenient for reference, if a head line stating the nature of the cases tabulated were put upon every page instead of only at the beginning of the list. When the tables include many pages it is difficult to find the special class desired, since the heading is given but once. Interesting histories are found scattered through this report; for example on pages 157-163, four aneurisms of the lower extremity treated by ligature are reported. In three of these gangrene necessitating amputation occurred, but it must be admitted that the cases were not simple ones. An instance of cerebellar abscess following inflammation of the mastoid cells is mentioned, but no reason given for the non-performance of drilling the mastoid process. The patient appears to have been admitted late in the disease.

The *Reports of the Ophthalmic Department*, and of the *Ophthalmic Out-Patient Practice* for 1879 are written by Mr. MACDONALD M'HARDY, and are replete with statistics. To the uninitiated general practitioner it would seem that the ophthalmic department of this hospital should be called the "Iridectomy Department," for certainly this operation is a decided favourite there. The lists, if no mistake is made by the writer in counting, include 85 iridectomies for therapeutic and optical reasons, and 28 in the various cataract operations; making in all 113 iridectomies among 204 patients in the wards. This seems, even to one who has seen a good deal of private and hospital eye work, a large proportion, even if each patient possessed (on admission) two eyes. The importance of this operation should not however be underestimated, for it is certainly a measure of great value; and its use in many affections is undoubtedly imperatively demanded. Might it not have been avoided, however, in some of the cases mentioned as so treated in the Report? They were instances of staphylococci, kerato-conus, corneal ulcer, hypopyon, keratitis, both vascular and interstitial, corneal opacities, kerato-iritis, irido-kerato-cyclitis, iritis, and cataract. Extraction of cataract was frequently done by the downward incision, which is bad surgery, especially if associated with iridectomy, as

it frequently was. The frequency of secondary operations after extraction is unsatisfactory. Pilocarpine, in the local treatment of corneal ulcers, was frequently employed, with, it may be inferred, good results. One case of keratoconus was greatly improved by trephining the cornea. In the out-patient department nothing requiring special notice is recorded.

The *Report of the Orthopædic Department*, by Mr. WARRINGTON HAWARD, contains some interesting facts in regard to the frequency of certain deformities. Sixty-five per cent. of the cases of flat-foot occurred between the ages of 15 and 20 years; sixty-four per cent. of the instances of spontaneous lateral curvature of the spine were between the ages of 15 and 20 years; seventy-four per cent. of the knock-knee cases were in children of between 3 and 5 years, and most of them showed other signs of rickets. There are recorded two cases of osteotomy for knock-knee, in neither of which did constitutional or local disturbance of any importance occur. In a case of antero-posterior curvature of the two tibiæ, perfectly satisfactory results were obtained by removing a wedge of bone.

The *Reports of the Aural and Dental Departments*, by Mr. DALBY and Mr. WINTERBOTTOM respectively, present nothing of great interest. In the latter it is stated that of the 1922 patients treated, ninety-three per cent. underwent extraction; hence nothing very remarkable, in a surgical view, is to be expected. Some cases of alveolar abscess, neuralgia, etc., are recorded. Two instances of hemorrhage, after removal of teeth, are reported as treated by lint steeped in perchloride of iron. How much better, as a rule, is pressure, easily applied by pushing a small cork into the socket, and bandaging the jaws together! Surgeons and dentists are long in learning that pressure is better than all styptics, because more effective and less deceptive.

Under the title of *Clinical Lectures delivered at St. George's Hospital*, Mr. T. HOLMES gives three papers, full of interest and instruction, and written with the greatest surgical acumen. The first is an account of a case of ilio-femoral aneurism, in which the iliac artery was tied with an animal ligature made from the aorta of the ox, after failure of compression, and while gangrene of the leg and foot was in progress. Mr. Holmes is well known as a writer upon aneurism, and displays his erudition in the present article. He thinks the superior safety of compression, in comparison with ligation, has been greatly exaggerated. His remarks on the points of pathology and treatment, suggested by this remarkable case, are worthy of great attention.

The second paper gives the history of an attempt to obtain osseous union of a refractured patella that had previously been united by ligamentous tissue. Incision was made with antiseptic precautions, and sutures introduced through the fragments. The patient nearly died from the suppurative inflammation that occurred; which, in Mr. Holmes's opinion, shows that, even with antiseptics, the operation is attended with too much risk to be generally adopted. Finally, he details a successful subperiosteal resection of the tibia, in which about eight inches of the bone were removed. The ankle-joint was involved in the inflammatory bone disease at the time of operation, but, notwithstanding this complication, the patient did well, and recovered with but an inch and a half shortening. These three elaborate papers are improperly, it is thought, called clinics, because they have apparently been written expressly for publication. Certainly, they are very different from the many clinics heard by the present writer during several visits to London. English clinical lectures on

surgery are far inferior to American clinics, while these papers, or so-called lectures, certainly surpass in diction, analysis, and erudition the surgical clinics of the leading American hospitals.

T. PICKERING PICK follows Mr. Holmes's lead by contributing a *Clinical Lecture on the Treatment of Wounds after Amputation during the last Twenty-five Years*. His conversational style is very attractive, and induces one to read every paragraph of his admirable account of the development of the present system of treating amputations with catgut ligatures, drainage-tubes, antiseptics, and wire sutures. The old-fashioned method of dressing such wounds with silk ligatures and sutures, with adhesive strips, and with tight bandages to prevent retraction and to shut in the putrid and irritating discharges, is quite justly accused of being the cause of much surgical fever and pyæmia. He believes in the advance made by Lister's researches, but states that, with all precautions carefully taken, the antiseptic method will at times fail. His results in excision of joints among children have been very different, and highly satisfactory since the adoption of the antiseptic plan of operating and dressing. He makes the following pertinent observations regarding Lister's dressings: "When, for instance, we remove our first dressings at the end of three or four days, we find, it is true, the edges of the wound in apposition, and looking, as we term it, perfectly quiet; but that is all. There is no attempt at union; there is no pouring out of what we used to call plastic lymph; there is no appearance of that little line of redness along the margin of the sore which indicates the inflammation necessary for the healing process; so that in fact, if we were to remove the sutures, the edges would fall apart." This, he says, evinces an absence of vitality and a sluggishness about the wound. He claims, however, that the antiseptic dressing promotes *healthy* suppuration—that is to say, prevents decomposition of pus. The paper is a calm, unbiassed expression of opinion of a thoughtful observer, who does not cling to the traditions of the elders, but thinks for himself.

The next article, *Observations on Certain Eruptions of the Skin which occur after recent Operations and Injuries*, by EDWARD C. STIRLING, is really a monograph on a subject that has received but little attention. It occupies fifty-five pages, and stamps the author as a careful investigator, an earnest worker, and a judicious writer. Medicinal eruptions have recently been carefully studied by Van Harlingen and others; and here is to be found a dissertation on surgical eruptions that forms a good companion to the investigations mentioned. The author first gives the literature and views of many writers who have reported cases of eruption similar to scarlatina occurring after operations. Paget's, Marsh's, and Smith's cases are frequently alluded to, in addition to many others which he himself has collected. He then analyzes a table of cases; discussing the age, mortality, and condition of wounds, in connection with the scarlatinous rash. The eruption he considers analogous to the similar cutaneous symptoms presented at times during the puerperal condition. The only case of the kind recollected by the reviewer is that of a man suffering with compound fracture of the femur, who had a brilliant red eruption during the course of the treatment for the injury. The notes of the case are not at present accessible, but the similarity to scarlatina and the absence of an endemic among the other patients in the ward were at the time subjects of great interest. Mr. Stirling relates a somewhat similar case recorded by Trélat. The paper is too long to have full justice

done it in this short notice, but the author's conclusions are important. He asserts:—

“That the rash and febrile symptoms which occur frequently as the immediate sequel of an operation are often those of scarlet fever; that the fever is, in some way as yet undetermined, dependent on the presence of the wound; and that when scarlet fever occurs under these circumstances, it undergoes certain deviations from the normal type of this disease” (p. 550). He says also that “there is evidence to show that there occurs sometimes after wounds and injuries what may be called a simple surgical erythema, often closely resembling the rash of scarlet fever, but independent of any connection with that disease; and that other eruptions of different type may similarly occur under like circumstances.”

The last surgical paper in the volume is that of JOHN H. MORGAN, entitled *Some Remarks on the Diagnosis of Hip-joint Disease*. He calls attention to the wasting of the muscles of the affected limb as a diagnostic feature; and also lays stress on the pain felt when the surgeon attempts to abduct the thigh. This rigidity of the adductors and pectineus is not sufficiently insisted upon by most writers, but is, in our opinion, a very definite and early diagnostic point. The author seems to believe it always present, and states that next to these muscles those flexing the hip are most prone to become rigid. Hence, painful abduction and painful extreme extension are important signs of incipient coxalgia. Persistent elevation and obliquity of the pelvis, when the patient is recumbent, is possibly due, in his opinion, to reflex nerve irritation, causing spasm and rigidity of the iliac portions of the erector spinæ and quadratus lumborum muscles. Some indications for the differential diagnosis between coxalgia, rheumatism, and psoas rigidity, due to caries of the vertebræ, are also given by the author. A number of illustrative histories are added.

On the whole, this volume of Reports is good, because the great excellence of four or five papers atones for much that, in a scientific point of view, is decidedly inferior. Tables of cases are of little value to the profession unless analyzed by the compiler, and yet hospital reports are often filled with them. They add much to the expense of publication, and serve only as padding, unless judiciously discussed by those who had charge of the cases, and who are thus enabled to judge of the relative importance of the facts tabulated.

J. B. R.

ART. XXVI.—*The Bacteria*. By Dr. ANTOINE MAGNIN, Licentiate of Natural Sciences, Chief of the Practical Labours in Natural History to the Faculty of Medicine of Lyons, etc. Translated by GEORGE M. STERNBERG, M.D., Surgeon U. S. Army. 12mo. pp. 227. Boston: Little, Brown & Co., 1880.

In pursuing his valuable researches under the direction of our National Board of Health, Dr. Sternberg derived, as he tells us, so much assistance from Dr. Magnin's admirable *résumé* of our knowledge in regard to the bacteria, that he was led to translate the entire work, for the benefit of his American co-workers, and also for the much larger number of physicians and scientists, who, without being themselves original investigators, take a profound and constant interest in every fact which contributes to elucidate those great medical and hygienic questions depending upon the germ theory of disease.

In his excellent preface Dr. Sternberg comments upon the mistrust which has been felt by so many cautious observers, in regard to so-called diseases of bacteria, micrococci, etc., in human and animal organisms, and explains it on the ground that results have been so contradictory; eminent men of various countries asserting and denying the very existence of these objects, in the most persistent manner. As he justly remarks:—

“Sometimes we are deceived by giving confidence to a man who has achieved reputation in one line of study, but of his skill and training in the use of the microscope we have no means of judging. Such a man may be a great clinician or a great chemist, and yet be a mere tyro with the microscope: when then we see it announced that Dr. So-and-so failed to discover any *micrococci* in pus, in blood, or what-not, taken from a certain source, we are justified in asking—first, what power did the learned doctor use? second, is he capable of distinguishing micrococci in fluids which contain them beyond all question? or, if he does discover them, we may ask if he is accustomed to making a differential diagnosis between micrococci and inorganic granular material, or unorganized granules of organic origin. This is a decision which the most accomplished microscopist is sometimes unable to make, except by the aid of chemical tests, and culture experiments.”

To obviate this want of confidence in results Dr. Sternberg urges the preparation, whenever possible, of photo-micrographs, and rightfully claims for the National Health Board, the credit of first systematically adopting this method, for preserving a constant and unimpeachable record of the objects observed. As specimens of these indisputable proofs, heliotype reproductions of a number of Dr. Sternberg's own photo-micrographs are given in the volume, several of these being of a high order of excellence, and invaluable as illustrations of the descriptions contained in the text.

Our author defines bacteria as the lowest known organisms, situated upon the limit of the animal and vegetable kingdoms, and as being “cells deprived of chlorophyll, of globular, oblong, or cylindrical form, sometimes sinuous and twisted, reproducing themselves exclusively by transverse division, living isolated or in cellular families, and having affinities which approach them to the algæ, and especially to the oscillatoriæ.” Bacteria were first discovered by Leuwenhoeck in 1675, and have been variously classified by different authors, but the arrangement of Cohn—into, 1, sphaero-bacteria or globular bacteria (*micrococcus*); 2, micro-bacteria or rod bacteria; 3, desmo-bacteria or filamentous bacteria; 4, spiro-bacteria or spiral bacteria—is probably the best.

Disputes among naturalists as to whether bacteria belong to the animal or vegetable kingdom, are now abandoned by mutual consent, but have been replaced by discussions as to whether they are to be ranged among the algæ, as contended by Davaine, Rabenhorst, and Cohn, or with the fungi as claimed by Robin and Nägeli. Another much mooted question is in regard to the existence of distinct well-defined species among the bacteria. Cohn dwells upon the impossibility of distinguishing with certainty genera and species among them, although he is convinced that they are divided into species (just as distinctly as the other plants and inferior animals) which our imperfect means of observation render us unable to recognize. Hallier, Billroth, Robin, Nägeli, and others, consider, on the other hand, the different forms of bacteria not as autonomous species, but as phases of development of one or perhaps of several species. Notwithstanding these opinions of the worthless nature of any supposed distinctive characters of bacteria, Dr. Magnin devotes over thirty pages to the classification and description of their genera and species, this por-

tion of the work being profusely and instructively illustrated by plates, selected (apparently) by Dr. Sternberg, and furnished by this gentleman in part from his own photo-micrographs, prepared under the auspices of the National Board of Health.

Part second of this valuable little volume is devoted to the physiology of the bacteria, and comprises sections upon the origin of bacteria, their nutrition and respiration, their reproduction, their rôle in fermentation, putrefaction, virulent affections, etc. Of these divisions, that treating of the connection of bacteria with the contagious diseases has, of course, the greatest interest and importance to the medical profession. Pasteur, according to our author, was the first to affirm the parasitic nature of septicaemia, and his observations were confirmed by those of Coze and Feltz, Davaine, Hallier, and Béchamp. As, however, Zuelzer, Sonnerschein, and Riemschneider, attribute the septic accidents to the effect of an alkaloidal poison, denominated sepsine, and somewhat resembling atropia, whilst they failed to observe any similar results when bacteria alone were injected into animals, Dr. Magnin declares that in the presence of so many divergent opinions, each supported by scientific authorities, he "does not feel justified in adopting any definite conclusion."

In regard to charbon or malignant pustule, our author informs us that Davaine observed the presence of rod bacteria in the blood of patients affected with this disease as early as 1850, but did not attach any importance to the fact, until after Pasteur's observations were published in 1861. The assertion of Cohn that charbon is also the result of a peculiar chemical poison, and not produced by bacteria, is explained by Pasteur, Bert, and Toussaint, by a theory that there are several varieties of malignant pustule, some of them quite independent of the growth of bacillus anthracis.

In like manner variola is attributed to the development of a bacterium (Coze and Feltz) or to a micrococcus (Luginbuhl and Weigert); scarlatina to a micrococcus (Hallier); diphtheria to a bacterium (Tigri, Oertel, Letzerich); typhoid fever to a bacterium; glanders and farcy to a micrococcus; and relapsing fever to the spirochæte *Obermeieri* (Cohn).

The next section, upon the influence of bacteria upon surgical lesions, with special reference to Lister's antiseptic method, contains much of interest, but Dr. Magnin's final conclusion is, "As to the rôle (of bacteria) in fermentations, in putrefactions, in contagious diseases, and in surgical lesions, notwithstanding the considerable number of labours of which the bacteria have been the object, in these different points of view, it is not yet possible to define it in a certain manner."

A copious bibliography of thirty pages, brought down to date by the translator, adds more to the value of the work, which we must again thank Dr. Sternberg for giving to the medical profession of America. J. G. R.

ART. XXVII.—*A Manual of Diseases of the Throat and Nose.* By FRANCKE HUNTINGTON BOSWORTH, A.M., M.D., Lecturer on Diseases of the Throat in the Bellevue Hospital Medical College, etc. 8vo. pp. xx., 427. New York: Wm. Wood & Co., 1881.

THIS work, following so quickly upon the group noticed in the last issue of this journal, will be compelled to withstand a much severer test

of criticism than if it had not been so recently preceded by a number of satisfactorily good treatises upon the same subjects. It is abundantly illustrated—too abundantly—to the extent of 175 cuts in the 410 pages of text. The majority of these are sufficiently familiar; having already done service, some of them several times, in works to which the attention of our readers has from time to time been directed. We question the propriety of authors' and publishers' attempts to rival the picture-collections of the instrument-makers: and why the necessity for so many engravings of appliances for the same purpose, when they vary merely by the position of a screw, or some equally unimportant modification? If the practitioner requires a knowledge of all these varieties of tools and appliances, it may be found in the catalogues of the surgical instrument-makers.

To justify our strictures on this point, we may mention that the author depicts no less than three varieties of reflectors attached to head-bands; and one of these is repeated in a picture representing the method of examination. One of the three, the one with the author's own modification, would have sufficed. In like manner, there are no less than six representations of tongue-depressors drawn to various scales. This deference to instrumental illustration will lead to much confusion in some instances in the present volume, when read by persons not familiar with the subject. Thus, an illustration of one laryngoscopic apparatus is overtopped by a reservoir, about which not a word is said in the immediate text, save a line beneath the figure, indicating "Sass's laryngoscope combined with a receiver for compressed air." The uninstructed reader would naturally suppose that this reservoir had something to do with the illumination, while it is really for the purpose of driving sprays, and has no direct connection with laryngoscopy. Again, the figure which, on one page, is made to do duty for Elsberg's nasal speculum, on another represents La Borde's tracheal dilator. In one of the borrowed cuts, representing the laryngoscopic mirror held in the left hand of the observer, and accredited to its original source, the assumption is made that the plate had been inadvertently reversed by the engraver, while in fact the picture was purposely designed to show the mirror held in that hand. Curiously too, although the author states that in looking through the head mirror the right eye only should be used, his illustrations, even that intended to show the use of his own instrument by himself, exhibit the left eye in position. Practically it is a matter of indifference which eye or which hand is used; the guide being habit or convenience of manipulation. The author criticizes the usual instruction given in exposing the larynx to laryngoscopic inspection. Thus, instead of directing the patient to endeavour to make the long sound of *ā* (as in *fate*), which really becomes *eh* (or *e*, as in *met*) in the process, owing to the physical laws governing the enunciation of vowel-sounds, he would have the patient pronounce the sound *ah*. In his own language, "in this manner the laryngeal cavity is brought thoroughly into view." If the reviewer should record his own experience, he would say that "in this manner the laryngeal cavity is completely hidden by the epiglottis," in the vast majority of instances.

These remarks are made because it is the duty of a teacher in a great medical school to be exceedingly accurate in his public instruction; and when this instruction is conveyed in the form of a systematic treatise there is always time to correct the text. We must take exception to the too-frequent advice, repeated in this volume likewise, to test the warmth of the laryngoscopic mirror upon the cheek. An unfortunate scratch on the face might be the inlet of syphilitic infection.

As to the subject-matter of Dr. Bosworth's manual, it embodies the results of the observation "of something over eight thousand cases;" in making which public he has endeavoured to confine himself to his own personal experience. The results from this experience, as would naturally be supposed, do not differ materially from what has already been recorded by others, sometimes in very similar expressions; but there are a few peculiarities which it will be of some moment to notice further on.

The sections on Anatomy, Etiology, and Pathology are concise, and, as a rule, accurate and instructive, and are accompanied with a series of well-selected illustrations.

We can hardly credit the amplified signification which the author has given to a term which, in our opinion, should be discarded as altogether indeterminate. We allude to *fauces*, which the author adopts "to describe the back part of the mouth and lower pharynx," including "the soft palate, uvula, pillars of the fauces, tonsils, and that portion of the pharynx which is visible by direct inspection." This is the most extensive definition of the term that we remember to have read. Consequently the section on "Diseases of the Fauces" contains chapters on Catarrhal Affections of the Pharynx; Croupous Exudative Affections of the Pharynx; Acute Affections of the Tonsils; Hypertrophy of the Tonsils; Systemic Diseases of the Pharynx; and Neuroses of the Pharynx.

The chapter on the Use of Instruments contains all that is essential to convey a correct idea of the manner of applying local treatment to the upper air-passages. We must take exception to the strong indorsement of the use of the air-condenser to drive sprays under great pressure. Our own experience is that, as a rule, a pressure of from two to five pounds is sufficient for all that is to be expected from this method of treatment. The author speaks of using a pressure "as high as fifty pounds." Over and again the writer has found a pressure of fifteen pounds, employed for cleaning purposes only, productive of hemorrhage when propelling spray against diseased mucous membrane, especially that of the nasal passages, where this excessive pressure is particularly recommended by the author. We cannot but suspect that the sprays are frequently used in cases in which skilful actual manipulations with the brush or sponge in the interior of the laryngeal and nasal passages must be fully as safe and far better.

In the treatment of chronic catarrhal pharyngitis, we observe that the author is accustomed to destroy the large bloodvessels with a small actual cautery, a procedure far preferable, in his experience, to any other.

In the treatment of pharyngitis sicca, we notice a high encomium is conferred upon the local use of sanguinaria and galanga in powder. Belladonna, too, is recommended in the same manner, one part to seven of lycopodium; a remedy which, theoretically, would only increase the dryness which it is intended to counteract. In excising an elongated uvula, an ordinary pair of scissors is recommended; and it is intimated that complete removal of the uvula may impair its function of completing the closure of the opening between the pharynx and the nose; thus permitting the escape of food into the nasal cavity. This is an observation with which we have not met before.

Acute follicular pharyngitis, and chronic follicular pharyngitis are included, with membranous sore-throat or croupous pharyngitis, in croupous, or exudative affections of the pharynx. Chronic inflammation of the pharynx is said to result "in the development of small masses of glandular tissue in a state of hypertrophy, this hypertrophy consisting of connec-

tive tissue, and large bloodvessels, and epithelial elements, together with retained secretions which have undergone degeneration ;" but it is not intimated whether this observation is simply based upon theoretic induction, or is the result of actual examination of the histological elements of the enlarged nodules. In the further description of this disease, allusion is made to a certain amount of neuralgic pain, referable to the throat and neck, which is ascribed to involvement of the terminal filaments of the nerves. The involvement of the lymphatic glands of the neck, which is attributed by the author to direct connection between the closed follicles of the pharynx and the cervical ganglia, is, we believe, confined to cases associated with diseased nasal mucous membrane, with which the cervical glands are in direct anatomical, lymphatic communication. In the treatment of this and similar affections, characterized by accumulations of mucus on the diseased membrane, stress is justly placed upon the necessity of thorough cleansing before applying local medication ; and the best method is stated to be the use of sprays propelled from a compressed-air apparatus, with a pressure of from fifteen to eighteen pounds. We believe that more is accomplished by this process than the mere cleansing ; that the impact of the finely-divided spray upon extended surfaces stimulates both the absorbent and the nutritive vessels, and is thus a direct element of cure. In accordance with the majority of observers, the author believes that when the nodules are old, the only method of relief is in their complete destruction, for which purpose he uses a series of iron wires heated to redness. A very good illustration of a series of wires for this purpose, of the author's own construction, accompanies the text. The section on hypertrophy of the tonsils, again reminds us of the instrument-maker's catalogue, no less than six forms of tonsillotome being represented. The author believes in removing the entire organ whenever possible ; asserting that, practically, the tonsil does not exist in health, and that, therefore, it is a mistaken idea to allow a part of the organ to remain, to fulfil any function that it possesses in the economy.

Strumous ulceration of the pharynx is described as entirely distinct from congenital syphilis, an opinion founded on failure in ameliorating the condition by anti-syphilitics. Still, the author considers it justifiable to administer anti-syphilitic remedies, but urges that they be given in connection with cod-liver oil, iodide of iron, and the like. He speaks highly of the frequent application of iodoform, combined with tannin and morphia, and repeated two or three times a week.

Distinct place is given to tuberculosis of the pharynx, as illustrated in the details of a case under the author's observation. In this connection an attempt is made to express, in tabular form, the characteristics which distinguish the ulcerative process in the pharynx, in syphilis, in phthisis, and in scrofula, respectively. In the treatment of this affection, insufflations of iodoform, with starch and morphia, are said to be quite efficacious in controlling the ulcerative action, and relieving the pain and cough. Herpes of the pharynx is described as a neurosis.

In the treatment of affections of the nasal passages, we find that Dr. Bosworth is a strong advocate for the use of the galvano-cautery in destroying hypertrophied tissue.

The sections on diseases of the larynx are quite full. Superficial acute laryngitis, its most frequent form, is described as subacute laryngitis.

Laryngeal phthisis forms one of the author's strongest, shortest, and best written chapters. He defines the disease as a chronic ulcerative pro-

cess, under the influence of some marked, general, and non-specific dyscrasia; thus dissenting from the prevalent view that it is dependent upon the specific influence of tuberculosis. It is apparent that under the head of laryngeal phthisis, our author includes those cases of ulcerative catarrhal laryngitis which are associated with broken-down conditions of the system from various causes; a connection in which the adoption of the term *phthisis* is of questionable propriety, as that term is almost universally employed as indicative of pulmonary lesion, whatever may be the form of the wasting-away, the consumption, the phthisis. The characteristic appearances described and illustrated are certainly those of disease associated with pulmonary lesion. These latter cases are rarely curable; some observers doubting their curability altogether. Dr. Bosworth says: "In the earlier stages the disease is curable, in probably the majority of cases; and even after the occurrence of extensive ulceration and destruction of tissue, I have seen cases recover." Certainly this must refer to ulcerative catarrhal laryngitis only, for the observations of all other authors have led to a far different opinion.

Dr. Bosworth's treatment consists of four steps, which he regards as important: first, thorough cleaning; second, local applications of mild astringents, alteratives, or resolvents; third, application of an anodyne; and fourth, the application of iodoform as a specific, at first daily, or every other day, and later, once a week or a fortnight. In summing up certain conclusions which he considers well grounded, he suggests that "tracheotomy is justifiable, as a remedial measure, when local remedies fail to relieve, and before it is demanded by dyspnoea from inflammatory stenosis."

The chapter on Stenosis of the Larynx is likewise good, short, and admirably illustrated. Neuroses of the larynx is the most extensive section in the book, and presents an excellent *resumé* of the subject. Bilateral paralysis of the abductors, quite a rare lesion, is illustrated by a record of thirty cases, original and selected, indicating its various modes of origin. The chapter on Tumours of the Larynx is less imposing than contemporary authors have made it, being concise, comprehensive, and judicious. The chapter on Artificial Openings into the Air-passages, on the contrary, is more extended, and introduces illustrations of two classes of instruments, which experience has proved to be both hazardous and dangerous. We allude to bivalve tracheal canulas, and tracheotomes. The final chapter, on Extirpation of the Larynx, gives brief records of twenty-three collected cases. Of these sixteen were performed for carcinoma, but one appearing to have been really successful. Of five cases for sarcoma, one was successful, as was one for granuloma, while in one case, performed for perichondritis and necrosis, the patient succumbed as the result of the operation. The voice-tubes of Gussenbauer and Foulis are well illustrated; but the description of the operation itself is too meagre for utilization, while lack of reference to their original sources renders the records of the cases unavailable for details of the operative procedure. An appendix of formulæ, referred to in the volume, concludes the text, which is, however, interspersed with many formulæ. An excellent index furnishes sufficient reference to the subject-matter.

While we cannot but consider this manual deficient in many respects as a systematic work upon diseases of the throat and nose, it is to be commended as an exhibit of an unusual familiarity with the affections of which it treats; and it contains many practical observations of great value, even to the experienced specialist.

J. S. C.

ART. XXVIII.—*Transactions of State Medical Societies.*

1. *Transactions of the State Medical Society of Arkansas at its Fifth Annual Session.* 8vo. pp. 120. Little Rock, 1880.
2. *Transactions of the Medical Association of Georgia.* Augusta, April 21, 22, 23, 1880. 8vo. pp. 251. Atlanta, 1880.
3. *Proceedings of the Louisiana State Medical Association.* New Orleans, March 31, April 1 and 2, 1880. 8vo. pp. 111. New Orleans, 1880.
4. *Transactions of the Mississippi State Medical Association,* Vicksburg, April 7, 8, and 9, 1880. 8vo. pp. 177. Jackson, 1880.
5. *Transactions of the New Hampshire Medical Society.* Concord, June, 1880. 8vo. pp. 143. Concord, 1880.
6. *Transactions of the South Carolina Medical Association.* Columbia, April 20 and 21, 1880. 8vo. pp. xlviii. 57. Charleston, 1880.
7. *Transactions of the Medical Society of Virginia.* Danville, October 19–21, 1880. 8vo. pp. 262. Richmond, 1880.
8. *Transactions of the State Medical Society of Wisconsin for the Year 1880.* Vol. xiv., pp. 207. Milwaukee, 1880.

1. The fifth annual session of the *Arkansas* Society was held at Little Rock, and in the opening address of welcome by Dr. A. L. Breysacher. Among the many gratifying signs of increasing importance and growth in the material prosperity of Little Rock, are quoted the establishment of a medical school, and a medical journal, the *Arkansas Medical Monthly*, both of which received the endorsement of the Association.

Dr. E. T. DALE, President of the Society, selected for his annual *address* the claims for recognition of medicine upon the government for encouragement and protection, and its dependence upon the intelligence of the community for its progress and perpetuity. In order to secure such recognition and appreciation it was urged that the profession should take a more active part in public affairs, and should be more interested in public legislation, as it is the duty of physicians, as citizens, to see that the interests of State Medicine are properly cared for.

At the last meeting of this Society a State Board of Health was constituted which subsequently received recognition and substantial aid from the National Board of Health; and at this session a *Report on State Medicine* by Dr. D. A. LINTHICUM, from the Committee on State Medicine, makes a very satisfactory report of the work of this Commission, and also upon the progress of sanitary science, with a statement of some of its requirements as applied to the community, showing a just recognition of the claims of preventive medicine.

Dr. J. B. CUMMINGS contributed a short *Account of the Yellow Fever as it appeared in Forrest City, Arkansas, during the Summer of 1879*, in which a history of the epidemic is concisely stated, including a graphic clinical history of the disease, as well as some general remarks upon treatment. Although not contagious in its personal sense, the disease is eminently infectious under proper favourable conditions, and in the opinion of the reporter "the strict quarantine established by the aid of the National Board of Health was of incalculable benefit in preventing the spread of the disease;" and he strongly commends the plan of quarantining an infected district rather than the rest of the country.

In an article upon *Expert Testimony without Compensation*, Dr. J. H. SOUTHALL refers to a case in which Dr. Breysacher and himself had been summoned by the defence to testify as experts without proper remuneration, in a case of whose facts they had no knowledge, in which they succeeded finally in obtaining a decision from Judge Jacoway, holding that "they could not be compelled to testify as experts unless paid as such." As there had, heretofore, been no decision nor precedent concerning expert testimony in the State, this case becomes of importance to physicians practising in Arkansas.

A Case of Impassable Urethral Stricture relieved by External Perineal Urethrotomy is reported by E. R. DUVAL, M.D.; one of *Fracture of the Coronoid Process of the Ulna* by J. E. BENNETT, M.D.; *Diabetes Mellitus*, by A. DUNLAP, M.D.; and one of *Septicæmic Poisoning and Mercurial Eczema caused by wearing vulcanite plates* for an artificial denture, by THOS. W. HURLEY, M.D. The case of diabetes occurred in a boy of eleven years and was well marked, it was treated with excellent results at first with calcium sulphide and iron, subsequently with sodium salicylate. Treatment lasted four months, during which period the diet was restricted. The amount of urine at the conclusion had fallen to the normal and did not contain an appreciable amount of sugar.

Interesting papers were also read on *Malarial Hæmaturia* by G. B. MALONE, M.D.; *Some Points in the Treatment of Pneumonia* by J. B. SHIBLEY, M.D.; and on *Scarlatina and its Analogues, Diphtheria, and Membranous Croup*, by C. E. NASH, M.D., which were carefully prepared, and the two latter especially are of considerable scientific value as bearing particularly upon rational treatment.

2. THE *Georgia* volume of Transactions contains a number of interesting practical papers that will repay perusal.

Dr. ROBERT BATTEY, under the title of *Scrofulous Diseases of the Joints Complicating Phthisis*, reports a case of a young man of 20 years, who suffered for nearly a year with suppurative inflammation of his left knee, and who presented the physical signs of consolidation of the left lung in the upper part of which a large cavity existed. Amputation was thought advisable, but was delayed by advice of a consultant on account of the advanced lung disease. Finally, the patient called for amputation of the thigh to release him from the intolerable suffering from which opiates had ceased to yield him relief. His condition was very unpromising, but the operation was performed in order to grant him euthanasia. Much to the surprise of his attendants, he made a rapid recovery; the appetite and powers of assimilation returned; his spirits improved, he slept without opiates; and in one month was out of doors on crutches. A year afterwards he had grown fat, had lost his cough, and was apparently fully restored to health, so that he was enabled to engage in business. After enjoying excellent health and leading an active out-door life for over three years after the operation, one day he had an accidental fit of coughing while eating, which resulted in a fatal hemorrhage of the lungs.

This case suggests discussion of the question, What is to be done with a scrofulous joint in consumptive subjects? Dr. Battey concludes that if there is a prospect of prompt healing of the stump amputation is the appropriate remedy. If this cannot be hoped for, the only recourse is palliation by evacuating pus, extending and immobilizing the joint, and applying antiseptic dressings.

The consideration of this and other cases reported may perhaps elucidate an obscure point in the pathology of phthisis. It is evident in many of these cases that the fault lies to a great extent in the insufficiency of the powers of nutrition; primary and secondary assimilation being below par, and insufficient for the wants of the system, denutrition and wasting necessarily result. The question arises, If the ordinary means are insufficient to bring up the powers of assimilation to meet the demands of the body, would not reducing these exactions by a definite amount make the two factors more nearly correspond? The common observation that after recovery from amputation of a large member, the patient ordinarily develops fat, would certainly favour the affirmative view; and strong support of it is also apparently furnished by cases like those of Dr. Battey, even though it be admitted that the joint disease may have preceded the pulmonary deposit. This consideration will probably never lead any surgeon to amputate a limb in order to cure phthisis; but, where a diseased joint brings up the question of operation, a certain amount of pulmonary disease would, if this view is correct, not merely be regarded as not a contra-indication, but indeed as an additional reason for performing the operation; for without it an unfavourable termination of the case may be regarded as almost inevitable.

The same surgeon also reports a case of *Ligation of the Common Carotid Artery* in a man, for the relief of repeated hemorrhages following a deeply incised wound near the angle of the jaw in the subparotid space. Tendency to syncope following the loss of blood, and the tying of the artery, was noticed for several days. Facial paralysis also appeared but afterwards gradually subsided, and his health was subsequently entirely restored.

In *A Report of Forty-Two Cases of Uncomplicated Stricture of the Urethra*, Dr. WM. S. ARMSTRONG gives a *resumé* of cases treated in his own practice during the year, and strongly advocates gradual dilatation in preference to urethrotomy or divulsion in uncomplicated strictures, on account of the acknowledged greater safety and convenience to the patient. Only two contingencies in uncomplicated strictures, in the mind of the author, would justify these operations, viz.: the resilient in the curved, and the irritable, and often resilient, stricture in the pendulous urethra. In dilating very narrow strictures, it is recommended to pass a filiform whalebone bougie and tie it in the urethra overnight; in the morning one or two others may be passed by its side. This expedient will often enable the surgeon to overcome spasm in a tight stricture, before inserting a steel bougie. Of the forty-two strictures cured by dilatation, one patient had a rigor with fever lasting a few hours, and another had a slight swelling of one testicle twice. In every case the necessity for the systematic use of the sound was impressed upon the patient in order to secure permanency in the cure.

The same writer contributes the notes of *two cases of aneurism*: first, a traumatic femoral following contusion with subsequent rupture and death, operation refused. The second, a popliteal, caused by ligation of the femoral. He also reports a case of compound *fracture of the skull*, with hemiplegia, followed by recovery, in a girl five years of age.

The Ophthalmic use of Quinine and its Therapeutic Action is the combined subject discussed by Dr. A. SIBLEY CAMPBELL, of Augusta, in connection with some ophthalmic operations and remarks on after-treatment. In a case of cataract extraction (man, 45 years) a perfect result ($V = \frac{2}{3}$ with a cataract glass) was obtained by a modified Graefe opera-

tion. A weak solution of ergot was used topically after the operation for the purpose of relieving conjunctival hyperæmia, and quinia was administered, fifteen grains a day at first, afterwards gradually withdrawn. In subsequently discussing the action of quinia upon the organism, he reaffirms the views of Dr. Robert Campbell published in 1858, that quinia primarily influences the circulation by causing contraction of the middle coat of the arteries, giving tone to vascular tissue, and preventing and dispersing engorgements, whether in the nerve centres or elsewhere; that it does not exert any influence directly upon the nerve structures themselves. This renders the agent of especial utility in all congestive disorders, and warrants its use after all surgical operations, including those upon the eye. Instillations of atropia, and topical applications of ergot (fl. ext. f3j, water f3vij), are also useful in reducing conjunctival irritation, and hyperæmia.

Dr. P. L. HILSMAN, of Albany, reported a *Case of Double Ovariectomy with Antiseptic Precautions*, death occurring on the nineteenth day from tetanus. The abdominal viscera were found in excellent condition at the autopsy; the pedicles, having been tied with silk ligature and cut short, were found encysted in an organized mass; not the least evidence of inflammation existed. The case, at first, did well after the operation, the temperature not going above 100°, but exposure to cold by an open window brought on the fatal attack of tetanus. The tumour had been growing for several years, and had been tapped several times. On one of these occasions, the patient was found to be pregnant, but she went on to full term, the growth of the tumour being much retarded. The operator attributes this influence upon development to the pressure of the gravid uterus; and recommends trials of systematic pressure in such growths. We cannot help calling attention in this connection to the remarkable results reported by Dr. Addinell Hewson from the treatment of uterine fibroids and fibrocystic growths by applications of earth, at the last meeting of the American Medical Association.

Some Disorders of the Genito-Urinary Organs, often Mis-named Spermatorrhœa, is the title of an interesting paper by Dr. JNO. THAD. JOHNSON of Atlanta, in which he calls attention to the great rarity of true spermatorrhœa; and the means of recognizing and treating hyperæsthesia of the neck of the bladder, stricture of membranous urethra, prostatitis, and vesical catarrh which are most frequently confounded with the disease in question.

Dr. CHAS. W. HICKMAN of Augusta read an essay upon *Amblyopic Affections, their Value in General Practice*, in which the status of amaurosis and amblyopia is defined and their relation to tobacco-poisoning, uræmia, optic neuritis following traumatism or exhausting diseases pointed out.

Dr. J. MCINTOSH, of Thomasville, presented a *Report of Seventeen Cataract Operations with Remarks*; in all but four, good vision was obtained. He gives the preference to Beer's knife, the corneal incision, with iridectomy, and incision of the capsule at its periphery; using atropia instillations daily after the operation.

Dr. G. F. WIRSEN, under the title of *Report of the Section on Gynecology for the Ninth Congressional District*, communicates a single case of dystocia from deformed pelvis (2½ inches transversely at the outlet) where after delivery by the forceps of a still-born child at full term, the patient was permitted to again proceed to full term without interference

although under the reporter's care from the seventh month. It appears from the report that after labour had set in on the second occasion the vigorous efforts of the uterus were supplemented "by two or three doses of the fluid extract of ergot," finally, by the aid of a lever made from an old spoon, in about three hours a living child was born, the forceps not having been applied for fear of destroying the child! The mother died—not, as might have been anticipated, from rupture of the uterus—but of exhaustion after several severe hemorrhages. There was no autopsy reported, and no information as to whether the hemorrhage was caused by a laceration of the cervix or not.

3. The first paper in the *Louisiana Proceedings* is the address by the President. Dr. J. W. Dupree considered the advantages arising from medical organization, and urges the importance of knowledge of public and personal hygiene. The annual oration was delivered by the Rev. Dr. Hugh Miller Thompson, who dwelt particularly upon the value of high personal character in the physician as the basis of true success.

The Standing Committee on State Medicine reported, through Dr. S. E. Chaillé, several new provisions in the interests of State Medicine proposed for the Constitution of Louisiana; amongst others to re-organize and render more efficient the State Board of Health.

Dr. T. G. RICHARDSON presented a report on *Hydrophobia*, based upon 53 cases collected by him by correspondence with physicians in the State, both city and country. More than half the patients were bitten during the hot season, white and black were affected in about the proper numerical proportion, in every case the disease was traced to dog-bites, the animals being usually of the smaller and more common varieties. The average incubation was about six to eight weeks, shortest four days, the duration of disease from one day to two weeks. In 45 cases no application, whatever, had been made to the wound with a view to cauterization; in one the wound had been excised and cauterized, in others nitrate of silver or ammonia had been used. In not a single case was nitric acid, the alkaline caustics, or the hot iron employed. In two the hair of the dog had been applied. Special medication was mentioned in 28 of the cases, three-fourths of which number took opium, chloroform, chloral, or bromide of potassium, in others atropia, and woorara were also used, without any benefit. In another series including twenty cases where persons had been bitten by rabid animals free cauterization by nitrate of silver (11), hot iron (1), hot iron and carbolic acid (1), iodine (3), and in four where the wound was excised as well as cauterized, all the patients escaped. This interesting report also contains a statement of the clinical points of the cases mentioned in tabular form.

Dr. R. H. DAY communicates a case of *incised wound of the abdomen* with protrusion of intestines. The parts presenting were washed and returned, the wound closed with sutures, a compress wet with whiskey applied, and by laudanum given by the mouth he obtained perfect quietude of the patient. The compress was removed on the sixth day and parts were found united by first intention. The patient completely recovered, in spite of the fact that the original injury (stab with a penknife) had made a gash two inches long in the greater curvature of the stomach, which was returned into the abdominal cavity without ligaturing, trusting to the roller and compress to maintain coaptation.

Dr. A. W. DE ROALDES advocates the use of *Cold Douche in Algid and Choleric Pernicious Fever*, being guided by the clinical thermometer.

Dr. M. SCHUPPERT presented a review of the Discussion on *Morbus Coxarius* at the International Medical Congress in Philadelphia, in 1876, in which some of the assertions made at that memorable meeting are criticized and apparently not without justice; those who are especially interested in the views there enunciated will peruse with interest this very readable critique.

4. The thirteenth annual meeting of the *Mississippi Association* was held at Vicksburg. The President, Dr. E. P. SALE, selected for his topic *The Duties we owe Our Women*, and discussed some hygienic and physiological questions, whose influence upon the health of mothers, and indirectly upon the future development of the race render them of paramount importance.

Reports of recent advances in surgery and obstetrics, and a short notice of new remedies appear. Dr. PHARES recommends *Ascyrum Crux-Andree* for *Pertussis*, a variety of St. John'swort, first used by physicians during the exigencies of the war, which caused many experiments to be made with indigenous plants. After using it tentatively at first, he found that it gave great relief in whooping-cough, and he subsequently had employed it in many cases, he had not heard of a single fatal case; it appears to cut off the morbid process in a few days. A strong recent infusion of the leaves and tops was employed.

Two papers on Hæmorrhagic Malarial Fever are contributed, the first by Dr. J. M. GREEN, under the title of *Malarial Hæmaturia*, and the other by Dr. B. F. KITTRELL, being the report of a case of *Hæmorrhagic Malarial Fever*; both being valuable clinical contributions to this interesting topic.

Dr. C. A. RICE read a short paper on the *Treatment of Wounds*, in which he expresses the opinion that in incised wounds the carbolic acid spray may prevent primary union; recommending in preference accurate coaptation and hermetically sealing. In penetrating wounds, on the other hand, this method is not recommended, but the wound should be allowed to remain open for drainage.

A number of reports of clinical cases of more or less interest conclude this interesting and well-printed volume; we notice, however, an unusual number of typographical errors, which indicate want of careful revision by the Publication Committee.

5. The present volume of the *New Hampshire Transactions* contains beside the annual address of the President four essays which are all interesting; we incline to the opinion, however, from the internal evidence that the chief motive of the meeting was æsthetic and social rather than severely scientific. The President, Dr. THOMAS W. PRAY, of Dover, selected for his theme the *Etiology, or Nature, Causes, etc., of Diphtheria*, and under the latter part of his title includes the historical *résumé*, pathological anatomy, clinical history, differential diagnosis with croup, and the treatment both prophylactic and clinical. In regard to etiology, diphtheria is looked upon as being due to a special poison, which is communicable, and associated with the development of micrococci in the body with the proviso that the latter may be the attendants and not the specific cause. Tender age, atmospherical influences and filth are all predisposing causes. The author recommends that the word croup be reserved as the name of

a symptom, and that laryngeal diphtheria be substituted where there is a false membrane and evidence of constitutional disease.

Dr. WILLIAM THAYER SMITH discusses the phenomena of *Suspended Animation*, and sums up his conclusions as follows:—

1. "That in the higher animals absolute suspension of all the vital functions never takes place except in death. In sleep, hibernation, catalepsy, and narcotism, which are the nearest approach to suspended animation, vital action may always be detected.

2. "That the question whether in any organism, vegetable or animal, life ever continues when its functions are absolutely suspended, is not settled. But some facts seem to indicate that there may be latent life without functional activity."

D. F. A. STILLINGS contributes an article on *Melancholia and its Connection with Ancient and Modern Suicides*, whose scope is well set forth in the title. The condition of melancholia should always be considered as suicidal, and appropriate moral treatment adopted. In ministering to the mind diseased the attention is primarily directed to the bowels, as inactivity of the intestines is very frequently a prominent feature. Tonics and persistent feeding with nourishing food, aided by cod-liver oil, and strychnia, phosphorus, and bark, are most efficient.

Two unusual surgical operations, *Ligation of the Common Carotid*, and *Exsection of the Inferior Dental Nerve*, are reported by Prof. L. B. HOW, with success in each case. The ligation was performed for the relief of hemorrhage following subcutaneous rupture of a large cirroid aneurism of the temporal region and forehead. Why the main trunk was tied in preference to the external branch is not stated.

6. The Presidential address before the *South Carolina Association* by Dr. F. M. ROBERTSON is a scholarly and temperate consideration of some of the fundamental assumptions involved in the hypothesis of evolution, and their failure to meet the requirements of science indicated, whether it concerns the nebular hypothesis, abiogenesis, and not a few of the various forms of fallacy that have been enunciated in connection with protoplasm. Darwin's "Descent of Man," in the second volume, contains a postscript stating that some of his former statements had been based upon an error, and in another place states "A brief summary will be sufficient to recall to the reader's mind the more salient points in this work. Many of the views which have been advanced are highly speculative and some no doubt will prove erroneous." The essayist adds, "These admissions are sufficient in themselves to discredit Mr. Darwin's hypothesis, and place his 'Descent of Man' beyond the pale of scientific productions."

Three cases of *Epileptiform Convulsions Successfully Treated by Hypodermic Injections of Sulphate of Atropia* are communicated by THOMAS LEGARE, M.D. The cases were all acute, one following injury of supra-orbital nerve, the others associated with menstrual disorder. The rather large dose administered was (gr. $\frac{1}{24}$) repeated morning and evening, and continued from ten days to two weeks.

Interesting cases of analysis in *arsenical poisoning* (following the method of Otto) and in *morphia poisoning*, were communicated by Dr. C. U. SHEPPARD, the analyses having been made by H. D. GEDDINGS, a medical student, who also contributed a good *Analysis of a Biliary Calculus*.

Reports of Executive Committee of Board of Health and from the State Board of Health are also included in this interesting volume of transactions.

7. In the *Virginia Transactions* two addresses and four volunteer papers appear, together with some discussions upon impromptu topics and a report on medical progress.

Dr. HENRY LATHAM, in his presidential address, considers some topics of more than local interest. The relationship of medical organization and medical progress was first taken up, from whence he naturally passed to the need of establishing a fully equipped Board of Health. Although permission had been granted by the Legislature to establish such a board, it was practically annulled by the condition that the State should be put to no expense in its support! Which would intimate that the representatives of the people did not know anything about sanitary science, and cared still less. Evidence of the want of appreciation of the services of medical men in Virginia is also shown by Dr. Latham, by quotations from the law permitting a court to engage a physician to attend prisoners in its jail, and for this service "to make him a reasonable allowance not exceeding seventy-five cents a day for each day he attends a patient." Twenty-five dollars is the extreme compensation to any physician or analytical chemist "for making an analysis to discover poison in any criminal case." In commenting upon the debased legal status of medical practitioners as compared with that of lawyers, the author says:—

"I am personally aware of a case in which a law fee of \$5000 was awarded a lawyer for writing a will. A fee of this magnitude would not have been allowed for medical attendance upon the lawyer's family for a full quarter of a century, yet the court thought it a reasonable charge. But the Legislature made up mostly of lawyers thinks seventy-five cents a day for a visit to prisons, and twenty-five dollars for a chemical analysis for suspected poison requiring days and perhaps weeks of labour, a very liberal fee for one of the disciples of *Æsculapius*."

In order that physicians as a class may make a better figure on the witness stand, the medical colleges are called upon to teach medical jurisprudence instead of allowing it as at present to remain an empty title in the annual announcement; on the part of the profession, it is recommended to make this department a serious specialty. After enumerating some other grievances of physicians in Virginia, Dr. Latham, in turn, congratulated the society upon the fact that the two medical schools in Virginia had adopted a compulsory three years' course prior to graduation.

The Status of the Medical Profession of Virginia is also considered in a volunteer paper presented by Dr. THOS. J. RIDDELL. It certainly cannot be very high, judged from its legal standing at least, any one being allowed to practise medicine by paying a license-fee of ten dollars; "nevertheless, the law requires a barkeeper to establish a good character before he can obtain license," to pursue his business. Certainly it is full time that doctors in the Old Dominion paid some attention to politics.

In a *Report on Advances in Practice of Medicine*, Dr. G. WM. SEMPLE, in referring to the treatment of hepatic abscess by aspiration, spoke of his own case, in which after two years of suffering and ill-health a hepatic abscess had opened spontaneously into the colon; he believed that his long illness might have been saved by timely aspiration as recommended by Hammond. Among new remedies, he mentions the hypodermic injection of the salts of quinia, particularly the hydrobromate of quinia in the treatment of intermittents. Less of the agent is required when given in this way, and it acts with equal certainty and more promptness in aborting chills. In using morphia and atropia hypodermically, the reporter administers by the mouth hydrobromic acid with much success, to avert the

distressing nausea and vomiting, which occurs in some patients. This idiosyncrasy he explains on the supposition that morphia may be converted into *apomorphia* in the blood of these cases. He also suggests the employment of the hydrobromate in preference to the sulphate of morphia. In *hemorrhagic malarial fever* he used atropia (gr. $\frac{1}{100}$ to $\frac{1}{8}$) hypodermically, every eight or twelve hours according to the severity of the case. Gelsemium, given in full doses (gtt. xx–xl of the fluid extract) in *neuralgia* and *muscular rheumatism* was used with excellent results, repeated every two or four hours until physiological effects begin to appear. A case of great prostration, collapse, and pains in the back and extremities following a *spider bite*, was completely relieved by intra-venous injection of aqua ammoniæ (m. xv) within a few minutes.

The Practical Bearing of Recent Advances in Cerebral Localization and Cerebral Thermometry, especially as regards the diagnosis of cortical injuries and the application of the trephine, was presented in an interesting communication by WM. C. DABNEY, M.D., illustrated by several diagrams, containing a summary of the present state of our knowledge of this subject, more especially following the monograph of Lucas-Championnière on "La Trepanation Guidée par les Localisations Cérébrales." Over a superficial collection of pus it is almost certain that there would be an elevation of surface temperature.

In a volunteer paper entitled *Some Remarks about a Common Functional Eye Trouble*, Dr. JOS. A. WHITE communicates some very practical and interesting facts in regard to asthenopia and its causes.

In a general discussion upon *Summer Complaint of Infants*, the character of cholera infantum as a distinct disorder, connected with high temperature, was generally agreed upon; in the treatment calomel or bismuth in considerable doses were equally endorsed; mild counter-irritation to the spine and abdomen were also recommended, with a diet consisting only of milk and lime-water (condensed milk preferred by some) or chicken-tea, but above all the importance of a change of air to the mountains or seashore was insisted upon. Subsequently tonics and mild astringents might be needed as sometimes in true cholera.

In a volunteer paper on *New Remedies* Dr. CHAS. R. CULLEN discusses the value of *Viburnum prunifolium* in uterine hemorrhage and threatened abortion, *Caseura sagrado* in constipation, *Berberis aquifolium* in syphilis and scaly disorders of the skin, and *Cereus Bonplandii* in cardiac embarrassment and dyspnoea.

8. *Honour to Medical Men* was the title of the presidential address before the Wisconsin Society, delivered by Dr. JOHN G. MEACHEM, Sr., of Racine, in which he dilated upon the devotion and self-sacrificing character of physicians' labours, which appear most conspicuously in times of public peril during the prevalence of an epidemic.

Dr. S. MARKS contributed some *Suggestions in Antiseptic Surgery*, more particularly in the details of its application to major amputations.

Dr. N. SENN read a contribution to our knowledge of *Fracture of the Rim of the Acetabulum* based on the reports of twenty-seven cases, with experiments upon the cadaver, in which the anatomy of the articulation and the pathology of this rare form of injury are briefly considered. In treatment, a fixed dressing after reduction is recommended, or if not enough of the rim of the acetabulum is left to prevent relaxation by muscular contraction, permanent extension and fixation are necessary. Some experi-

ments upon the cadaver led to the conclusion that fractures through the floor of the acetabulum are more apt to occur than simple fractures of the rim, they require a less degree of violence to produce them, and their greater mortality is attributable to co-existing visceral lesions rather than to the increased amount of bone injury.

A case of *Fracture of the Superior Maxilla*, in which an interdental splint of hard rubber was successfully used, was reported by Dr. J. F. PRITCHARD, and the details of application explained. The case was one of compound fracture caused by the crush of a horse's foot; healing was completed in about four weeks.

Uterine Hemorrhage in its various forms, but more particularly the forms incident upon pregnancy, are discussed by Dr. G. F. HUNT, and the appropriate methods of treatment are considered under each head. In the treatment of accidental hemorrhage in the eighth or ninth month, where the flow of blood is constant, the uterine pains weak and ineffectual, and the patient's strength much exhausted, the author strongly recommends perforating the head and introducing the hook, and generally succeeds in saving the patient. This in some parts of the world would be considered as rather heroic, and to be adopted only in extreme emergency, when the loss of the child is beyond question. We would invite Dr. Hunt's attention to the admirable consideration of the subject in Dr. King's paper on *Placenta Prævia* contained in the *Indiana State Medical Society's Transactions* for 1879. Four other obstetrical papers were presented and are included in this volume. One on *Version or Forceps in Pelves Narrowed in the Conjugate Diameter*, by Dr. GEO. SEILER (giving a very fair consideration of the present status of this important question), and the other on *Presentation of the Funis*, with notes of ten cases by Dr. J. G. MEACHEM, Jr.

An interesting article on *Acute Anterior Poliomyelitis* (or Infantile Paralysis) with a report of three cases in children is contributed by Dr. JAS. DORLAND, in which the clinical features of the cases (which all occurred in one family) are clearly detailed, with some remarks upon treatment, in which electricity and cod-liver oil prominently appear.

A case of *Medullary Cancer of the Left Kidney*, with involvement of surrounding viscera, was reported by Dr. GEO. M. STEELE, with some remarks upon the pathology and course of this malignant form of growth. It is remarkable that in these cases uræmic symptoms are never observed.

The present volume is handsomely printed on extra paper, and the clear typography greatly enhances the pleasure of reading this exceedingly practical and more than usually valuable series of papers. F. W.

ART. XXIX.—*Du Rheumatisme Chronique Nouveux des Enfants et de son Traitement*. Par le Dr. MONCORVO, Membre de l'Académie Impériale de Médecine de Rio de Janeiro. Traduit de Portugais et annoté par le Dr. MAURIAC de Bordeaux. 8vo. pp. 148. Paris: Octave Doin, 1880.

On Chronic Nodular Rheumatism in Children and its Treatment. By Dr. MONCORVO.

CHRONIC nodular rheumatism occurring in children forms the subject of a monograph which was submitted to the Société de Médecine et de

Chirurgie de Bordeaux by Dr. Moncorvo, on the occasion of his candidature for the title of Corresponding Member of that Society, and is a paper which, apart from the fact that it is the only monograph which has appeared on this subject, by its general thoroughness has warranted its publication in a more accessible form than the original Portuguese.

The author's attention was directed to the subject in 1874, when he had under his care a little girl, aged two and a half years, of a marked lymphatic temperament, and who had been nourished by a large number of wet-nurses, in most of whom some scrofulous or rheumatic taint was detected. The child when only a few months old was greatly debilitated by a severe and prolonged attack of whooping-cough, which left her pale and feeble, with glandular enlargement and a tendency to attacks of impetigenous eruptions. The rheumatic symptoms appeared, without exposure to wet or cold, as a subacute rheumatic fever, implicating the knees; after the febrile symptoms subsided the radio-carpal and tibio-tarsal articulations became implicated but without any renewal of the general febrile reaction; the symptoms then remained stationary for about a month, when febrile symptoms again appeared, accompanied by exacerbation of the articular disorder and an inflammatory oedema of both legs. This second crisis disappeared and the case developed into one of marked chronic nodular rheumatism, the condition of the patient being thus described by the author: "Incomplete extension of the lower limbs, due to the retraction of the muscles and ligaments of the knees (pseudo-ankylosis), and interfering with the erect posture; external lateral deviation of the legs, particularly of the left (angular ankylosis). Contracture of the flexor muscles of the legs on the thighs and of the thighs on the trunk. Retraction of the posterior ligament of the knees, preventing, as we have already said, extension of the legs. Crepitation, due to the rupture of 'osseous stalaetites,' was readily produced on energetic motion of the diseased joints." The phalangeal articulations of the thumbs and index fingers, the wrist and great toes, are the seat of extremely painful nodes. No cardiac lesion was ever discovered.

This case furnished Dr. Moncorvo with the text for a thorough and systematic study of the occurrence of rheumatism in children, the multiple etiological conditions which tend to develop this affection, among which he recognizes heredity and the bad hygienic states dependent on want as important factors, its medical geography, symptomatology, pathological anatomy, diagnosis, prognosis, and treatment. The treatment of this disease has been above all studied with the greatest care. He has passed in review the numerous medications which have been proposed, with most of which, with the exception of cold baths and salicylic acid, the latter not being introduced by Dr. Sée until 1877, he had himself had experience in the treatment of his case, before it occurred to him to employ electricity. This latter remedy he recommends most highly as a certain and radical cure, and certainly his statements seem to be warranted by his remarkable success. He used both the constant and induced currents; the former from twenty-four chloride of silver elements (Gaiffe) was passed for ten minutes every other day through the diseased articulations; on the alternate days the induced current from a small Gaiffe bisulphate of mercury battery was passed through the atrophied muscles. At the close of each séance massage and the gradual breaking up of the adhesions in the joints was practised. "After more than forty séances of electrization and massage, the patient was able to maintain herself in the erect posture

without any support and to walk in an almost vertical position. The external angular deviation of the left knee was scarcely perceptible. The nodes and pains had entirely disappeared. In these conditions we discontinued the employment of electricity and abandoned to natural movements the completion of the cure, which we are justified in terming radical, since two years and a half have already elapsed since this epoch, and there to-day exist no traces of this terrible malady."

Nearly all authors agree as to the extreme rarity of any form of rheumatism in early childhood, while a case of chronic nodular rheumatism is then almost unique, only three cases, including Dr. Moncorvo's, having been published up to the date of his communication; since then one has been reported by Dr. Daily in the *Gazette Hebdomadaire*, occurring in a little boy, and cured by douches, manipulation, and the constant current. Dr. Moncorvo's paper is then particularly valuable as furnishing a thorough study and apparently successful treatment of a disease which few physicians have an opportunity for seeing.

The translator has added notes on the employment of terebinthinate baths and statical electricity in the treatment of this affection, and a tabular statement of the frequency of occurrence of rheumatism in Bordeaux.

R. M. S.

ART. XXX.—*Il Servizio Di Chirurgia Ostetrica al domicilio del povero. Esportazione Utero Ovarica per grave angustia di pelvi rachitica, praticata il 3 luglio 1880, dai sanitari dell'Ufficio d'Igiene, col concorso di quelli di beneficenza: sopraparto da nove giorni: guarigione della madre, relazione del* DOTTORI RAMELLO CANDIDO *e* BRAMBILLA LUIGI.

Service of Obstetrical Surgery at the homes of the poor. Utero-ovarian ablation for grave rachitic deformity of the pelvis, performed on July 3, 1880, under physicians of the Board of Hygiene, and of the Society of Beneficence: woman nine days in labour, cured. Reported by Drs. CANDIDO RAMELLO *and* LUIGI BRAMBILLA. 8vo. pp. 30. Turin, 1880.

IN the early days of Turin, large numbers of difficult obstetric cases were delivered in her hospitals, where the mortality was very great; but in the rebuilt and modernized city, with its improved hygienic conditions, the great majority of such cases are treated at their own homes, by physicians connected with certain benevolent medical societies, somewhat like those in operation in our cities. The Porro operations of Turin have been chiefly in hospital; but two of the three recoveries were in private houses. There have been thus far, 7 operations; 5 in hospital and 2 in their own homes; these two were saved, and one of the hospital cases. Perhaps, no Italian case, or any in Europe, made as remarkable a recovery considering its difficulties, as the one we are about to describe, which was operated upon by Dr. Candido Ramello, one of the younger physicians of Turin, attached to the Sanitary Municipal service. In nine months of the year 1880, this service assisted in 1013 labours among the poor, of whom 5 died, three being forceps cases (superior strait), and two cases of turning. The results of this service have been quite in contrast with those in the old maternities, where puerperal peritonitis and septicaemia have been very prevalent.

Margarita D., 19, married, of rachitic descent, seized with rickets in the first year of infancy, and at a late period attacked with caries of the right ilium. These diseases left her with dorso-lumbar scoliosis; contortion of the ilium affected; a small pelvis, and a nearly closed superior strait. She lived in extreme poverty, under the roof of a six-storied Mansard house; and in addition to all the disabilities named, had a decidedly hemorrhagic diathesis; one brother, a hæmophilian, having bled to death when three years old. She was taken in labour on the evening of June 24th, and was at first under the care of a midwife. On the fourth day a physician who was called in made a fruitless attempt to introduce the forceps, and then retiring, advised them to wait. The midwife recommended the patient to apply to the Bureau of Hygiene, which was finally acceded to on July 3d at 5 P. M., and physicians were sent to take charge of the case.

By this time, the fœtus was dead and putrid, and the woman in a condition very unfavourable for success. It was decided to perform the Porro-Müller operation, which was done at 9 P. M., after fully nine days of labor, the uterine being first secured by the constrictor of Kœberle, and then by the clamp of Thomas; the operation was performed in 27 minutes. Observations of temperature, pulse, and respiration were recorded from three to five times a day for a month. The temperature at its minimum was 98.04° , and maximum 104.01° , the latter on the seventeenth day. Peritonitis set in on the second day, with nausea, and occasional vomiting attacks. The clamp was removed on the sixth day, and the pedicle separated on the thirteenth; by the 27th day the temperature had fallen to its lowest point reached. The woman finally recovered her health entirely.

Porro Operations since January 1, 1880.¹

No.	Date.	Operator.	Locality.	Result to	
				Woman.	Child.
42.	Jan. 2, 1880.	Dr. Hausner.	Barmen, G.	Died.	Dead.
43.	" 9, "	" Previtali.	Bergamo.	"	Alive.
44.	" 17, "	" L. Championnière.	Paris.	"	"
45.	" 28, "	" Gus. Veit.	Bonn.	"	"
46.	Feb. ?, "	" Valtorta.	Venice.	"	Dead.
47.	" 17, "	" Chiarleoni.	Milan.	"	Alive.
48.	" 25, "	" Mangiagalli.	"	Lived.	"
49.	March 2, "	" Kaltenbach.	Freiburg, G.	"	5 months.
50.	" 7, "	" Gus. Braun.	Vienna.	"	Alive.
51.	" 18, "	" Wasseige.	L'ère, B.	Died.	5 months.
52.	" 20, "	" Hubert.	Louvain, B.	"	Alive.
53.	" 29, "	" Cuzzi.	Modena.	"	"
54.	April 8, "	" Taylor.	New York.	"	"
55.	May 28, "	" Carl Braun.	Vienna.	Lived.	"
56.	June 1, "	" Omboni.	Cremona.	Died.	"
57.	" 13, "	" Tarnier.	Paris.	"	"
58.	" 24, "	" Peruzzi.	Lugo, I.	Lived.	"
59.	July 3, "	" Ramello.	Turin.	"	Dead.
60.	" 4, "	" Oppenheimer.	Wurzburg.	"	Alive.
61.	Aug. 16, "	" Agnew.	Phila.	Died.	6 months.
62.	(?) "	" Pasquali.	Rome.	"	(?)
63.	Sept. 22, "	" Richardson.	Phila.	Lived.	Alive.
64.	Oct. 21, "	" Fiki.	Warsaw.	Died.	"
65.	Dec. 2, "	" Tibone.	Turin.	"	Dead.
66.	" 15, "	" Gus. Braun.	Vienna.	Lived.	Alive.
67.	Jan. 21, 1881.	" Parona.	Novara, I.	Died.	"

¹ Cases from No. 1 to 42 have been previously reported, among the first fifty Porro operations. See number of this Journal for July, 1880, p. 129.

Cases 42, 51, 58, 59, 60, 61, and 63 were operated upon by the *long incision*, and the uterus turned out before it was opened. In case 60, under Dr. Leon Oppenheimer, the cervix was not constricted until after the removal of the foetus, and the contraction of the organ; when it was clamped, as in ovariectomy. There have been in all twelve Müller operations, with six recoveries. Of the cases regarded as *favourable* for the operation, 4 recovered, and 1 died; of the *unfavourable*, 2 died; and of the *very unfavourable*, 3 died and 2 recovered. The case under review; and one in which there were symptoms of septic endometritis, from a decomposing foetus, with gas in utero, were the two last referred to.

There have been seven recoveries in cases of osteomalacie, against twenty of rachitic deformity. The latter class of subjects is much the more numerous, and has perhaps a slight prognostic advantage over the former. With care in preparing the patient, the osteomalacic woman has a very fair prospect of recovery, and may have her disease arrested by the removal of her ovaries.

Italy has saved 10 out of 29 cases, and all Europe 27 out of 63; the whole mortality being 39 out of the 67.

R. P. H.

ART. XXXI.—*A Treatise on the Principles and Practice of Medicine: designed for the use of Students of Medicine.* By AUSTIN FLINT, M.D., Professor of the Principles and Practice of Medicine and of Clinical Medicine in Bellevue Hospital Medical College, New York, etc. Fifth edition, revised and largely re-written. 8vo. pp. 1150. Philadelphia: Henry C. Lea's Son and Co., 1881.

In preparing this fifth and greatly improved edition of his valuable work the author has not been unmindful of the limitations which the finite powers of man impose upon him in every department of knowledge, and which usually are most clearly recognized by those who have done most to extend them. Hardly any physician can attain the highest degree of knowledge in morbid anatomy and pathological microscopy and chemistry, and at the same time be equally distinguished as a learned medical scholar, an accomplished clinical teacher, and a skilful practitioner of medicine. The limits of life and attainment are such that, with rare exceptions, the greatest men are greatest only in a comparatively narrow sphere, from which indeed, the light of their genius and the fruits of their labour may be diffused upon other fields in which they are not without rivals. Hence it is that in every work upon a composite subject like medicine, inequalities of merit are inevitable in its several parts when they are all executed by the same hand.

That the author of the present treatise was conscious of this hindrance to its ideal perfection is shown by his employing the collaboration of Dr. Welch, one of his colleagues in the Bellevue Hospital Medical College, where he holds a lectureship on Pathological Histology. The share assigned to him in the work has been well performed. He appears to have caught the spirit of his principal in distinguishing between the intrinsic and the accidental, the settled and the conjectural, in his department. Such partnership in a treatise embracing both pathology and therapeutics and intended as a guide for practitioners as well as a text-book for students of medicine, is peculiarly appropriate.

Even if Dr. Flint's position were not so well established as it is, he would easily be recognized by any competent reader of this work as a physician whose long experience and dispassionate judgment have led him to form definite opinions upon most of the subjects he undertakes to discuss. His conclusions, without being in the least dogmatic as to form, have generally the weight of judicial decisions. He has no theories to advocate or defend, for he belongs to that school which has never been without witnesses in the world, and which, while not indifferent to creeds, places truth above all creeds. This is the spirit which inspired the following passage in the preface:—

“In making changes, the author has not been influenced by any sense of obligation to maintain consistency of views with the previous editions of this treatise, or with other works which he has written. Wherever statements are found to vary from those made at a prior date, the simple explanation is that the latter, in the light of more recent reflections and enlarged knowledge, seemed to him no longer tenable.”

It is in a like spirit that the whole work has been revised, and how conscientiously may be learned from this statement. After alluding to the work of his associate, Dr. Flint says:—

“In other portions of the treatise will be found many changes, which have somewhat enlarged the size of the volume, in spite of the omission of a considerable amount of matter, and the re-writing of many portions with a special view to condensation. Among these changes are, the introduction of a new section, devoted to the diseases of the hæmatopoietic system, the classification of the diseases of the nervous system on an anatomical, in place of a symptomatic, basis, a fuller consideration of various diseases, and the addition of several which were not considered in the previous editions. In the descriptions of individual diseases, larger space is accorded to the morbid anatomy, including histological appearances, and to the pathological character. In short, it may be claimed for the present edition that the eliminations, substitutions, and additions render it essentially a new work.”

Whoever carefully examines the volume will admit that this statement is a very moderate one of the increased value of the present as compared with former editions. And yet there may be some who will be disappointed that so small a space in the volume is occupied by eulogies of those new remedies which flaunt before the searcher after knowledge in ultra-scientific journals and treatises, which swarm in legions like vermin upon the covers and advertising sheets of medical periodicals, and even impertinently thrust themselves into the very midst of the text between the leaves of such publications. Of the class of medicines called antipyretic, from cold water to aconite, Dr. Flint speaks with marked hesitation, and as briefly as the necessity of mentioning them at all will permit. He cannot divest himself of the ancient belief that while the physician bestows the care, nature performs the cure. His own accurate observations upon this subject, in regard to several diseases, leave him no other alternative. There is little evidence in the work of his faith in the doctrine that the symptoms of disease rather than its fundamental state are the primary object of therapeutics. He would not have us believe that for every cord in this “harp of a thousand strings” the materia medica holds some consonant drug. If he must choose between the *vis medicatrix nature* and the *nimia diligentia medici*, he does not hesitate to pronounce in favour of the former.

Its predominant good sense is one of the qualities which have caused Dr. Flint's treatise to be so highly esteemed; and as the present edition has all

the merits of the earlier ones, and, in addition, a large amount of scientific as distinguished from clinical information which was less conspicuous in them, it cannot fail to confirm and increase the reputation of the work which they established.

Another distinctive feature of this volume, and one in which it surpasses similar English, and, we believe it may be added, French and German treatises of the same description, is the completeness of the sections relating to diagnosis. Completeness, with accuracy and conciseness, it may be added. This portion leaves upon the mind distinct and sharp cut impressions. It is what a physician, in ignorance or doubt respecting diagnosis, most of all desires. He is apt to be irritated by half statements which appear to him more like the non-committal promises of officials than the naked truth which is an attribute of genuine science. He desires to learn the limits of possible knowledge as well as of positive ignorance. To such a searcher after truth this work brings relief even when it does not supply definite information.

In a word, we do not know of any similar work which is at once so elaborate and so concise, so full and yet so accurate; or which in every part leaves upon the mind the impression of its being the product of an author richly stored with the fruits of clinical observation, and an adept in the art of conveying them clearly and attractively to others. A. S.

ART. XXXII.—*Medical Diagnosis with special reference to Practical Medicine. A Guide to the Knowledge and Discrimination of Diseases.* By J. M. DA COSTA, M.D., Professor of Practice of Medicine and of Clinical Medicine at the Jefferson Medical College, Philadelphia; Consulting Physician to the Children's Hospital, etc. etc. Fifth edition, revised. 8vo. pp. 924. Philadelphia: J. B. Lippincott & Co., 1881.

THE first edition of this work was published in 1864. An extended analytical review of that edition, in this Journal, ended with the following words: "It may be welcomed as a text-book, which will do credit to our national medical literature." The estimate of its value, as thus expressed, was confirmed by the favourable consideration which it received both at home and abroad, and was substantiated by the speedy exhaustion of the first edition. During the sixteen years which have elapsed, the work has passed through four editions, and its position as a valuable text-book has been steadily maintained.

The success of a work devoted chiefly to diagnosis, shows, first, that the medical profession appreciate the importance and the difficulty of that branch of medicine, and, second, that the work fulfils most satisfactorily the objects for which it was written. It is unnecessary to say more of the merits of the work. In doing so, the writer of this notice would simply repeat the opinions which he has expressed in his notices in this Journal of the subsequent editions.

In revising the work for the fifth edition, the author has found it necessary to rewrite in a measure the chapters on the nervous system and on the blood. New developments within late years relate especially to these nosological divisions. The evidences of a thorough revision are also apparent in other portions of the work. The revision secures for this edition

a position in relation to the medical knowledge of to-day, corresponding to that which the first edition held at the time of its publication. We congratulate cordially the author on the completion of the task of preparing a new edition, and on the merited success of the work for the future as in the past.

A. F.

ART. XXXIII.—*Treatise on Diphtheria*. By A. JACOBI, M.D., Clinical Professor of Diseases of Children in the College of Physicians and Surgeons, New York; Physician to Bellevue, Mount Sinai, and the German Hospitals, etc. 8vo. pp. xi., 252. New York: William Wood & Co., 1880.

FOR the quarter of a century, during which, according to the reiterated opinion of our author, diphtheria has been continuously endemic in New York City, Prof. Jacobi has had ample opportunity of combating the disease in all its phases, and of testing the value of therapeutic measures, medical and surgical, to an extent perhaps unequaled on the continent of America. From time to time, during two decades, various papers on the subject have been promulgated from his pen, and his extemporaneous observations have been recorded in current summaries of the proceedings of medical organizations. Well known, in addition, as a close student of medical literature as well as a careful, judicious, and successful practitioner of medicine, hardly any one could be named in this country from whom a treatise on diphtheria would be more warmly welcomed at the present period, when its subject is the cause of much anxious personal consideration among practitioners, and the theme of much comment in medical debate.

The treatise contains nine chapters simply headed History, Etiology, The Manner of Infection, Contagion and Incubation, Symptoms, Anatomical Appearances, Diagnosis, Prognosis, and Treatment; the chapters on Symptoms and Treatment being by far the largest of the series.

The historic record is full enough to satisfy any inquiry, and traces the appearance of the disease in the New England district as far back as the year 1659.

In contrasting the greater susceptibility of children to the disease as compared with adults, an argument is drawn from the fact that of more than two hundred and fifty cases upon whom the author had performed tracheotomy, but two were over thirteen years of age. This, however, is hardly in point; for the larger calibre of the larynx and trachea of the adult secures him from the mechanical obstruction to respiration that renders resort to the operation so incomparably more frequent in the child. As is well known, there are but one or two well attested records of successful tracheotomy for diphtheria in the adult; a result attributed to the septic progression of the disease which precedes the comparatively late period at which the more capacious air-tube of the adult becomes occluded by accumulating products.

Most writers credit males as more frequent subjects of diphtheria than females, but Dr. Jacobi does not recognize any predisposition in favour of either sex. He mentions that of some six hundred cases in which he either personally performed tracheotomy or observed the progress of the

disease in the practice of others, the majority of operations were in males, but the greater proportion of recoveries were in females.

Anatomical reasons are given for the greater susceptibility of children to diphtheria. Prominent among these are the succulence and softness of the mucous membranes involved, the greater protuberance of the tonsils, and the greater number and larger size of the lymphatics. The slightly acid secretion of the mouth beginning with the third month of life is held as a physiological reason for the comparative infrequency of attacks between that period and the tenth month. Reserve is expressed as to the special influence of season of year, which is regarded as indirect and conditional, and probably comparable to those influences which may be summed up in the term "filth," whether from uncleanness of person, clothing, food, air, or habits. The question is put whether foul exhalations, whether from sewers or filthy habits, are to be regarded as special influences or simply as causes of deterioration in the standard of health, thereby affording other morbid influences an opportunity to exercise their power. And in the uncertainty which surrounds the problem, the question remains unanswered.

After presenting the arguments usually adduced, and the authorities usually cited in favour of the organic nature of the diphtheritic poison, our author, in his summary,—and a careful summary of its arguments concludes each chapter in the volume,—denies that the presence of bacteria in the diphtheritic blood has been proven, or that there is any theoretical ground for assuming that preventing the bacteria of a diphtheritic patch from making their way through the underlying mucous membrane will, *per se*, prevent general diphtheritic infection of the system.

While acknowledgment is freely accorded to the constitutional origin of many cases of diphtheria, distinct claim is made for its frequent origin in a manner purely local; and a number of interesting examples are given of this local mode of infection, corroborative of the author's positive assertion. Attention is called to the fact that different amounts of the poison material of diphtheria may be absorbed by different individuals, and that this absorption may occur slowly or rapidly; and from these premises it is argued that there will naturally occur a difference in the severity of the constitutional manifestations and in the rapidity of the elimination of the poison on the one hand, and in the moderate amount of constitutional disturbance and the indolent course of the toxic elimination on the other.

Great stress is laid, and with good reason, on the contagiousness of diphtheria. The chapter on this subject contains several arguments abstracted from a German periodical on veterinary medicine and comparative pathology.

The chapter on Symptoms, as already announced, is one of the largest in the volume. These symptoms are narrated anatomically under the sub-headings: pharynx and palate; nasal cavities; eye; ear; epiglottis, larynx and trachea; inflammatory affections of the lungs; diphtheria of the mouth, œsophagus and the cardiac portion of the stomach; intestinal diphtheria; wounds; muco-salivary diphtheritis; skin; diphtheria of the genito-urinary organs; kidneys; the heart and blood; and the nervous system. They include, therefore, all the rare and occasional symptoms which are likely to occur during an attack of diphtheria.

The chapter on Anatomical Appearances is quite minute, detailing not only the aspect of the upper air-passages, but the changes in the heart, the

lungs, the spleen, the kidneys, the muscles, the lymphatic glands, and the intestinal canal. The peculiarities of different forms of the diphtheritic affection in certain localities are explained mainly by the varying character of the different elements of the mucous membrane in these localities. The description of the mucous membranes from mouth to bronchi is quite elaborate, and their differences and analogies are summed up in a special table. It is Prof. Jacobi's opinion that these anatomical conditions, with their attendant physiological functions, will aid in solving the question as to the "mooted difference" between croup and diphtheria; the prevalence or absence of lymphatics, the richness or poorness of blood supply, respectively favouring or repressing the development of the general phenomena and the severity of their symptoms.

"It can easily be demonstrated," too, the author states, "that where the elastic tissue of the mucous membranes is present to a large amount, an antagonism to diphtheritic impregnation is maintained for a long time, but when it is obliged to yield, there is a corresponding resistance to recovery." In all probability the intensity of the process which becomes infective over great obstacles, so profoundly impairs the powers of resistance that they are rendered incapable of sustaining themselves; and thus re-convalescence is slow or impossible.

The chapter on Diagnosis shows us how frequently it is difficult to exclude the diagnosis of diphtheria from absence of special indications, which, under ordinary circumstances, are characteristic. Thus absence of membrane, of fever, of lymphadenitis do not necessarily impair the diagnosis, though membrane, fever, and lymphadenitis are the most prominent symptoms of diphtheria.

Dr. Jacobi acknowledges the existence of primary diphtheria of the trachea and ascending croup, though admitting its infrequency. An abrupt attack of stenosis of the larynx, with resultant cyanosis within an hour or less thereafter, is mentioned as the prominent indication for the diagnosis of this fatal form of diphtheria. In some fifteen cases of this kind operated upon by Dr. Jacobi, not one lasted longer than a day from the commencement of urgent symptoms to their end in death, and many of them lasted but a few hours only. The prognosis varies with the character of the epidemic actually prevailing. While considering ten per cent. a high death-rate, the author states that in severe epidemics the mortality is ninety-five per cent., just the opposite to the mortality of five per cent., which in many a year it did not exceed. While in average epidemics tracheotomy will save twenty per cent., in fifty consecutive tracheotomies from 1872 to 1874, Dr. Jacobi did not see one recovery. As to individual cases, it is believed that there is hardly a disease in which the prognosis is more uncertain than in diphtheria.

The chapter on Treatment, occupying eighty pages, discusses almost all the remedies, some named in Latin and some in English, which have been used systemically or locally in the management of diphtheria; even to the employment of *massage*, recommended within the year by Biela Weiss, and recalling to our mind a fifteen-year old pamphlet of the Director of the Kinesopathic Institution at Cassel, in which all the motions for treating croup by nature's method of percussing the neck, stroking the wind-pipe, and rolling the head so as to loosen the membrane, are illustrated with expressive wood-cuts; not to speak of various other manipulations with chest, abdomen, arms, etc., calculated to produce the same result! Jaborandi seems to be almost, if not quite, the only drug that has escaped

the scrutiny of the author. The author concludes, after all this expression of opinion and description of methods, that every case should be treated on general principles. Alcohol is, with him, an important adjuvant and remedy, employed in doses of from two to twelve ounces daily according to circumstances. Debilitating complications, such as diarrhœa, must be stopped instantly. Acute catarrh of mouth and pharynx requires the use of potassium or sodium chlorate, in doses not exceeding one scruple daily for a child of a year, and two drachms for an adult, the single doses being small and repeated every hour, half-hour, or fifteen minutes; large doses being liable to induce nephritis, or even to prove fatal.

Locally, the main indication is local disinfection. Chloride of iron is indicated as one of the most reliable antiseptic and astringent agents; small doses at long intervals being useless, and moderate doses frequently repeated having a satisfactory general and local effect. At least one drachm of the tincture, daily, is given to a child of a year, and two or four times the amount to one of two or three years. It is directed to be mixed with water and glycerine so that a dose is taken from every hour to every ten minutes as may be required. In this way the local application to the throat, it is averred, becomes superfluous.

This treatise of Dr. Jacobi is comprehensively and carefully prepared, and is, in our estimation, the best volume on diphtheria to which the American practitioner can have access.

J. S. C.

ART. XXXIV.—*Imperfect Hearing and the Hygiene of the Ear.* By LAURENCE TURNBULL, M.D., Ph.G., Aural Surgeon to the Jefferson Medical College Hospital, etc. 3d ed., 8vo., pp. 147. Philada.: J. B. Lippincott & Co., 1881.

THIS brochure is the third edition of Dr. Turnbull's little book on "Tinnitus Aurium." The fact of its having gone through two editions is an evidence of its popularity with the profession. The present issue is an enlarged one, and a number of other topics of interest to the otologist and general practitioner have been added. So that the book now is simply a collection of monographs upon several important otological subjects. There has also been added an introduction, in which the recent progress of otology is traced. Chapter I. is devoted to the "Limit of perception of Musical Tones by the Human Ear." Chapter II. deals with "Tinnitus Aurium and Observations on Aural or Auditory Vertigo with Diagnosis and Treatment," in which Dr. Turnbull gives his experience in the use of hydrobromic acid and hydrobromic ether in the treatment of that most annoying of all aural symptoms, tinnitus aurium. This experience has been eminently satisfactory to the author, and it is hoped the profession may give these remedies a fair trial. Chapter III. is on the "Importance of Treatment of the Naso-pharyngeal Space, Tonsils, and Uvula in Acute and Chronic Catarrh of the Middle Ear." Chapter IV. is on "Artificial Perforation of the Membrana Tympani." Chapter V. "The Mastoid Region and its Diseases, with Illustrative Cases." Chapter VI. "On the Hygiene of the Apparatus of Hearing, with the Prevention of Deafness," in which many valuable hints and suggestions as regards the care of the ear are given. Chapter VII. "On the Method of Educating the Deaf-

mute at home, and on the Selection of Proper Schools for the Deaf and Dumb," a subject in which the non-professional man is interested as much as the professional. Chapter VIII. "A comparison between the Audiphone, Dentaphone, etc., and the Various forms of Ear Trumpets," in which the experience of the author is stated as coinciding with that of all others who have experimented with the Audiphone and Dentaphone, viz., that they are in every respect inferior to the ordinary ear trumpet.

On all of these subjects, Dr. Turnbull has much to say that would interest the specialist as well as the general practitioner. He shows himself familiar with the literature of the subjects he writes about, and has given—when necessary—abundance of cases from his own practice to illustrate the positions he has taken.

S. M. B.

ART. XXXV.—*Coulson on the Diseases of the Bladder and Prostate Gland*. Sixth edition, revised by WALTER J. COULSON, F.R.C.S., etc. 8vo. pp. 607. London: J. & A. Churchill, 1881.

It is not surprising that, after a lapse of twenty-five years since its last edition, many and considerable alterations should have to be made in the text of a work on the diseases of the urinary bladder. The science of surgery has, in this time, made great strides forward, the surgery of the genito-urinary organs keeping step, more or less, with its fellows. The changes of the past quarter of a century have, however, in this particular department, been more in the direction of learning the refinements of physiology and pathology and elaborating the details of treatment and operations, than in that of discovery or actual invention. What is, is better understood, and what may be done, can be more rationally carried out than formerly; but nothing radically new has been added to the treasures of the first half of this century.

The book before us has served two generations, faithfully representing the current opinions of both. It comes again before the medical public fitted to the wants of the present day. In theory and practice it may be referred to with confidence by the student or the surgeon. In the former regard, we find it especially satisfactory; the views expressed being fully abreast of the times, and giving evidence of a wide and well-selected reading. We find at the beginning of the book a full discussion of the question as to the power of absorption possessed by the mucous membrane of the bladder, the conclusion arrived at being that of Mercier, that when the epithelial coat is intact—which it very often is not—absorption is almost impossible. The discussion of the physiology of micturition is very interesting, a variety of experiments and conclusions being quoted with the greatest impartiality. We think, however, enough is not made of the fact that the emptying of the bladder is a positive act of the will, that natural retention is only the suspension of this act, that unnatural retention is always dependent upon mechanical obstacles, paralysis of the detrusor muscles, or abnormal and perverted motor impulses to the sphincters; while, on the other hand, incontinence depends upon the existence of unnatural passages, paralysis of the sphincter, or abnormal motor impulses to the detrusor muscles. We think, too, that the sphincter action of the perineal and urethral muscles is not sufficiently emphasized;

an action not only sufficient, when involuntary, to keep the bladder from emptying itself *guttatim*, but also strong enough, when acting under the will, to resist very powerful involuntary efforts of the bladder to discharge its contents.

The chapters on cystitis are excellent, but might be more concisely and systematically arranged. This is especially true of the important matter of examination of the urine, directions for which are scattered about, when they should be given a chapter by themselves, to be referred to whenever necessary. The chapter on fistulæ of the bladder contains a second-hand description of Bozeman's method of operating for vesico-vaginal fistula. This is perhaps as much as can be expected in a work of this character; but surgeons who have such an operation to perform will probably not be satisfied with less than they can find in American works on the diseases of women.

Neuralgia and irritability of the bladder receive careful and thorough consideration from Mr. Coulson. Their symptomatic value is properly emphasized, and the way to search for their causes indicated. An analysis of the urine is the first and an indispensable step in every such case, a step that is as yet far less understood by medical men than it should be, though there has been of late considerable improvement in this respect. For the irritability in children, dependent upon a long and adherent prepuce, the author suggests the propriety of circumcision—an operation quite common in this country. In speaking of atony of the bladder, there is cited a case where the attending physician was struggling to overcome a fancied inability to retain the urine, and where a consultant at once drew off five pints. This is given as a warning against a mistake which only gross ignorance or carelessness could bring about. Medication for atony or paralysis of the bladder is recommended in a tentative way, Lebert being quoted as an authority against the use of ergot and nux vomica, and Gross as thinking them both efficacious. It is surprising that the author gives no personal experience to help in deciding this question. In the chapter on hæmaturia the microscope is said to afford the surest means by which blood may be discovered in the urine; it might be said to afford the only reliable means. There is good space wasted in quoting descriptions of the appearance of blood cells, space which might far better have been occupied with a cut; for any one who has paid much attention to this subject knows that the ability to recognize blood corpuscles or, indeed, almost any of the solid matters in the urine, is acquired by seeing them, best of all under the microscope and with the guidance of a teacher, and next in well executed drawings. In reading this chapter, we wish again for one which shall once for all describe systematically the methods of examining the urine. Hæmatinuria, or hæmoglobinuria, as it is called, might, we think, have been mentioned in this chapter, since its rare observance heretofore may be partly due to the fact that so many men have never heard its name.

The author devotes two hundred and fifty pages to the subject of calculi of the urinary passages, constituting by all means the most valuable part of the work. It is pleasant to find here and elsewhere in this book appreciation of the work of that patient and thorough observer and admirable teacher, Ultzmann, whose investigations have done so much to throw light upon the origin of vesical calculi. In reading, in the pages on the symptoms and diagnosis of stone in the bladder, of the difficulties sometimes encountered, we were reminded of an operation we witnessed, and which

has never yet been published, where the operator, having cut an old man, could not find the stone. Every effort to do so failed. Finally, a distinguished bystander bared his arm, oiled his hand, insinuated it and half his forearm into the patient's rectum, felt all round, even thrusting the wall of the abdomen up with his fingers to demonstrate the reliability of his statement that he had thoroughly explored the pelvis, and declared there was no stone there. Yet, a few minutes later, the operator, who could not give up, even on such evidence, seized with the stone-forceps and withdrew a calculus larger than a walnut.

The chapter on lithotomy is excellent, and is supplemented by one exclusively devoted to the method of Bigelow,¹ which he has named litholapaxy. The success of this new method may now be regarded as thoroughly established. It is growing in favour in this country, and a recent letter from London assures us that, since its introduction in England, "lithotomies in the adult have become even more scarce than they were before."

It is not to be wondered at that Cheselden's operation is the method of lithotomy the author thinks the best. He is not unacquainted with other methods, of course, and they receive due mention. The first he considers is suprapubic lithotomy, which he says is called the high operation—an awkward name which ought to be, and is to a very great extent, abandoned. This method receives a qualified dismissal as rarely to be adopted.² The author fortifies his judgment by giving a full account of a badly managed operation by Civiale. He need not have gone so far to illustrate his point, as two cases never published, but known all about in Edinburgh, would probably have served his purpose equally well. And, if in the mood to read of horrible operations, he might turn to Sir Astley Cooper's *naïve* report (in his *Surgery*, London, 1836, p. 385) of his operation, by the lateral method, on "Mr. —, of Fore Street, in the City."

The recto-vesical operation is also rejected by the author; we think properly so. The bilateral and median operations present no advantage, in his opinion, over the lateral. This latter, Cheselden's operation, is to almost all lithotomists the method of election. It is fully described here, and its statistics compared with those of other methods. The solvent treatment of calculi the author thinks only applicable to small uric-acid stones. The preventive treatment suggested consists in attention to hygiene and the administration of alkalies and diuretics with a view to prevent the precipitation of the salts of the urine.

The concluding chapters treat of the affections of the prostate gland.

As a whole, we can speak very highly of Mr. Coulson's book; it is full and thorough, its style is easy and clear, and, as a monument to its original author, it deserves admiration. If there are defects in it they are in the direction already indicated. Much has been gathered from modern writers—Gross, Ultzmann, and Podrazki, being the most frequently appealed to—but we would be glad to have more of the personal experience and opinions of the author and the editor. There is too much tendency in these days to make books encyclopædic, to fill them with references and bibliographies. This may be well enough for young and inexperienced writers, but when we come to men of large experience and observation, whose names are well known, we are apt to want their conclusions, even if they

¹ American Journal of the Medical Sciences, Jan. 1878, p. 117.

² The subject of supra-pubic lithotomy has been very thoroughly investigated by the writer of this review, and the conclusions he has come to are far more favourable to it than those of Mr. Coulson. (See *Amer. Journal of the Medical Sciences*, July, 1875, July, 1877, and April, 1878.)

have sometimes to be given dogmatically ; and we care more for what they have winnowed out of the grain they have gathered than to be never so candidly showed the whole heap, and offered the opportunity to go through the process for ourselves.

C. W. D.

ART. XXXVI.—*Health Reports.*

1. *Third Annual Report of the State Board of Health of Connecticut for the fiscal year ending November 30, 1880 ; with the Registration Report for the year ending Dec. 31, 1879.* 8vo. pp. 252. Hartford, 1880.
2. *Report of the Board of Health of the State of Louisiana for the year 1880. Extracts containing report of JOSEPH JONES, M.D., President, together with official correspondence with National and Local Boards of Health ; and Quarantine and Sanitary rules and regulations of the Board.* 8vo. pp. 149. New Orleans.
3. *Sixth Report of the State Board of Health of California for the year ending June 30, 1880.* 8vo. pp. 136. Sacramento, 1880.

1. THE *Connecticut Health Report* opens with a concise, yet comprehensive digest of the sanitary investigations it records, furnished by the able secretary of the Board, Dr. C. W. Chamberlain, from which we gather the gratifying intelligence, that an improved public sentiment in regard to sanitary affairs is manifested throughout the State, and that in many well-known instances, individuals and health authorities have successfully contended with the hygienic problems, pressed upon their attention in previous reports.

Dr. Chamberlain informs us that though there have been a greater number of epidemics than the previous year, the mortality was not excessive. Measles was exceedingly prevalent, scarcely any children escaping, and second or even third attacks occurring. Local epidemics of typhoid fever were reported from several sections, and in one of these instances the infection was traced, as shown by a map, to the pollution of the soil from sewers. Smallpox has reappeared in the mortality lists for the first time since 1876, but a threatened epidemic was averted by prompt isolation of cases and vaccination of exposed persons. Urgent attention is again called to the danger of using ice from ponds the water of which has been contaminated by sewage, and this curious proof that the typhoid fever germs (like the yellow fever germs) are not killed by a freezing temperature seems worthy of special notice.

A thoughtful and suggestive letter from Prof. W. H. BREWER upon *Public Health vs. Public Wealth* is worthy of a wide circulation among the legislators of other communities besides those of New Haven, to whom it is addressed.

Among the special reports, that of Robert Briggs, Esq., the eminent civil engineer of Phila., upon the plans for warming and ventilating the Bridgeport School-house, should be carefully studied by sanitarians. Dr. Chamberlain's paper upon sewerage problems is of particular local interest to the inhabitants of the towns of Hartford and New London, but it also contains much general information upon the subject of our means for the disposal of waste and polluted water.

The question of the transmission of tuberculosis by the meat and milk

of infected animals, is discussed by Dr. N. Cressy, V.S., who arrives at the conclusion, that, since the experiments of Villemain, Chauveau, Colin, Bollinger, and others, have shown that tubercular disease of almost all the organs of the body can probably be conveyed by the ingestion of meat and milk from infected cattle, it is time for our most enlightened minds and professional experts, to devise and enforce such measures as will protect our tables, control the traffic in diseased food, and if possible stamp out the malady among our herds. The whole subject is of great interest and importance.

This report also contains interesting information concerning the work of the Board in examining railway employ  s in reference to colour-blindness, which is noticed upon another page.

2. The *Louisiana* Report is chiefly made up of documents to prove that the National Board of Health was wrong in its assertion that yellow fever existed in New Orleans during the summer of 1880. Now it must be admitted that, as the event proved, there was no need of any of the threatened quarantines against New Orleans, although it is impossible to say how far the dread of these annoying and vexatious measures had to do with the thorough disinfection of suspected persons, places, and cargoes, which appears to have been very thoroughly practised by the Louisiana Board of Health; so that practically the question whether one or two dozen of the suspicious cases of fatal "hemorrhagic malarial fever" (accompanied by black vomit) were really yellow fever or not, possesses but little general importance from a sanitary point of view.

As a problem in diagnosis it is almost impossible to decide between the two opposing authorities, without more complete data than those furnished to us in our copy of the report, from which by an error (doubtless of the binder), pages 104 to 113, upon which are printed, we presume, most of the details of the suspicious cases, have been omitted.

We trust that a more general conviction of the great advantage to the whole body politic of all the States in our Union, arising from prompt and hearty obedience to *one* central authority, upon matters of national quarantine, will induce our southern brethren to voluntarily submit, in the near future, to the regulations promulgated by the National Board of Health.

3. Dr. F. W. Hatch, permanent secretary of the *California* Board, records, with much gratification, a smaller death list, and the absence of any serious epidemic except pneumonia. A few cases of smallpox were reported, and, in the crowded tenement houses of the Chinese quarter of San Francisco, it threatened to become epidemic, but energetic, though severe, measures of isolation and disinfection practised by the Health authorities averted this misfortune. Consumption is credited with 954 deaths, or about 16 per cent. of the total mortality, and of these 954, 147 were among persons born upon the Pacific slope, 270 on the Atlantic border, and 524 were of foreign birth. The unsanitary condition and total disregard of hygienic rules manifested by the native Mexican and lower half-breeds are thought to predispose to phthisis. Pneumonia was very prevalent, causing 505 deaths, or about 8 per cent. of the total mortality.

Dr. Hatch further contributes a long and valuable paper upon the mineral springs of California (which should be consulted by every physician who directs a patient to those fountains of health), and also a report upon the sanitary condition of the city of Sacramento. Dr. J. P. Widney

offers some useful suggestions respecting "Sanitary defects in houses and manner of living." The report of a committee on the establishment of a State Hospital for consumptives signed by Drs. F. W. Hatch, H. Gibbons, Sr., and W. R. Cluness, awards the preference to Atlas Peak in Napa County, as combining all the advantages of location in the highest degree, and incidentally affords valuable information to invalids seeking the advantages of the equable climate of the Pacific coast. A digest of the Health Laws of California occupies the remainder of the volume.

J. G. R.

ART. XXXVII.—*Cyclopædia of the Practice of Medicine*. Edited by Dr. H. Von ZIEMSEN, Professor of Clinical Medicine in Munich, Bavaria. Vol. IX. *Disease of the Liver and Portal Vein, with the Chapter relating to Interstitial Pneumonia*. By Prof. PONFICK, of Rostock; Prof. THIERFELDER, of Rostock; Prof. Von SCHUEPPEL, of Tuebingen; Prof. LEICHTENSTERN, of Tuebingen; Prof. HELLER, of Kiel; and Prof. JUERGENSEN, of Tuebingen. Translated by ARTHUR H. NICHOLS, M.D., and HAMILTON OSGOOD, M.D., of Boston; EDWARD W. SCHAUFFLER, M.D., of Kansas City; and WALTER MENDELSON, M.D., of New York City. ALBERT H. BUCK, M.D., New York, *Editor of American Edition*. 8vo. pp. viii., 928. New York, William Wood & Company, 1880.

WITH the issue of the present volume the publishers complete the series comprised under the title of "Ziemssen's Cyclopædia." Originally designed to appear in fifteen volumes, the work has outgrown its proposed dimensions until it now numbers seventeen volumes, the additional volumes having been rendered necessary by the unexpected accumulation of material.

In a few points the gentlemen who have written for this volume will be found to hold views differing somewhat from those taught by Prof. Frerichs in his classical work on "Diseases of the Liver." This is notably true of Ponfick's explanation of those cases in which jaundice occurs independently of obstruction of the gall-ducts. It will be remembered that in Frerichs' opinion the icterus is due, under these circumstances, to the conversion of the biliary acids, which are constantly being absorbed from the intestines into bile-pigment; while Ponfick, on the other hand, teaches that it is frequently due to the extensive destruction of the red blood corpuscles and the subsequent change of hematin into bilirubin. This view is, of course, not novel, but it has much to recommend it. Indeed it is not easy to explain in any other way the sudden occurrence of jaundice after a fright, or during a paroxysm of anger, or other violent emotion.

Thierfelder has introduced a brief notice of a condition which has been recently fully described by Charcot and others, and which we have some reason to believe is not generally recognized in this country. We refer to "hypertrophic cirrhosis with icterus." The first symptoms of this disease are derangements of the digestive function, pain in the hepatic region, icterus, and fever. The jaundice is usually decided, but is not necessarily associated with decoloration of the feces. It often persists, though with fluctuations, during the entire course of the affection. Very soon, enlargement of the liver is added to these symptoms. This increase in size is often considerable, frequently causing the organ to project in the mammary

line three or four fingers' breadth below the arch of the ribs, and sometimes very much lower. The left lobe is occasionally more affected than the right, and may extend even into the splenic region. The weight of the liver amounts to between 2000 and 3000 grammes; its form is often not perceptibly altered, its free margin is sharp, its outer surface smooth or studded with flattened prominences, not larger than a small pea.

Any reduction in the volume of the organ appears, Ponfick says, extremely rare, even when the affection is of quite long duration, and he has never known it to be reduced below its natural size. The duration of the disease is usually very much greater, and the occurrence of cachexia and emaciation much longer deferred than in the ordinary form of cirrhosis. Ascites, if present at all, occurs much later. Death is often ushered in by severe cerebral symptoms. According to Charcot, the primary lesion in this disease consists in an inflammation of the interlobular gall-ducts induced by an unknown cause. This gives rise to an interstitial proliferation which takes its start from the walls of these ducts.

One of the most interesting articles in the volume is that by Juergensen on "Interstitial Pneumonia," or, as we should prefer to call it, "Fibroid Phthisis." It seems out of place, however, in a volume consecrated to the description of diseases of the liver, and will probably escape the attention of many students, who would otherwise be only too glad to consult it. We remember having to point out a similar incongruity in the contents of one of the other volumes. As the article is too long to be discussed in a brief notice like this, we shall only call the attention of our readers to the prominence which its author gives to hæmoptysis as a sign of the disease. "The spitting of blood," he says, "especially the oft-repeated variety, is far more common in the chronic forms of lung disease not leading to phthisis¹—the anatomical basis of which forms interstitial pneumonia—than it is in phthisis, whether the latter be accompanied by the development of tubercles or not."

This volume is, like its fellows in the series, enriched by full bibliographies which precede the articles in each special subject. The reader will, however find a more frequent reference in them to German authors, than to those of any other nationality.

In concluding our notice of this series, it is proper to say that we see no reason, now that the work is complete, to modify materially the favourable opinion we have expressed from time to time in regard to it, while it was in process of publication. The most serious defect we have found in it, is that scarcely sufficient attention is paid to the treatment of disease. On the other hand, the descriptions of the pathology of the different diseases are usually excellent, and much fuller than is to be found in any other work on the Practice of Medicine with which we are acquainted. J. H. H.

ART. XXXVIII.—*John Hunter and his Pupils.* By S. D. Gross, M.D., LL.D., D.C.L. Oxon., LL.D. Cantab., etc. 8vo. pp. 106. Philadelphia: Presley Blakiston, 1881.

A REQUEST, by the Philadelphia Academy of Surgery, to deliver the first anniversary address, led to the production of this memoir. Prof.

¹ *I. e.*, cheesy degeneration of the lungs.

Gross has written much ; but it cannot be said of him, that it would have been better had he written less. Medical literature owes to him a vast debt of gratitude for all that he has written. For this, his latest production, he selected a grand theme, and it is grandly handled. He has written a charming memoir of Hunter and his pupils. It will be read with profit as well as pleasure. May the distinguished author, honoured over the world, and beloved by all who enjoy his personal friendship, live many years longer ; and may he continue his contributions to medical literature as long as he lives !

A. F.

ART. XXXIX.—*Recent Works on Typhoid Fever.*

1. *Croonian Lectures on some points in the Pathology and Treatment of Typhoid Fever. Delivered at the Royal College of Physicians of London.* By WILLIAM CAYLEY, M.D., F.R.C.P., Physician to the Middlesex Hospital and to the London Fever Hospital, Lecturer on Medicine to the Middlesex Hospital School of Medicine. 12mo. pp. 126. London : J. & A. Churchill, 1880.
2. *Relapse of Typhoid Fever, especially with reference to the Temperature.* By J. PEARSON IRVINE, M.D., B.Sc., F.R.C.P. Lond., Assistant Physician to Charing-Cross Hospital ; Physician to the Victoria Hospital for Children ; etc. 8vo. pp. 144. London : J. & A. Churchill, 1880.

1. DR. CAYLEY'S three lectures, which now appear in book form, were originally published in the *London Medical Times and Gazette* (March, 1880), shortly after they were delivered. In the first lecture the author discusses the question of causation and mode of dissemination. He points out our ignorance of the nature of the typhoid poison and our failure to isolate it or demonstrate its microscopical or chemical properties. That the specific poison introduced into the system multiplies, that it is contained in discharges of the patient, and that thrown into the drains, cesspools, etc., it retains its activity or power of re-development for a long period, when again placed under favourable circumstances, are the practical points of our knowledge or deductions.

Of the subsidiary question whether the typhoid poison can be generated *de novo* or only by continuous propagation, the author expresses his belief that the arguments in favour of the latter method of propagation far outweigh the former. The long retention of activity by the typhoid poison and the many easy modes of communicating the disease make this question so subtle, that the proof of the *de novo* origin of a case becomes almost, if not quite, impossible—in fact, nothing short of its development in primeval and untrodden forest or an isolated island in mid-ocean, unvisited by the outer world, could prove incontrovertibly the *de novo* origin of typhoid. However, we must remember that there was once a *first* case, and that this case had a source, in what circumstances we know not. This first case either originated *de novo* or else it came as a result of evolution.

The origin or dissemination of typhoid by the meat or milk of infected animals also receives attention. Of course, in the well-known milk epidemics of this disease, the source of the poison is the contamination of the milk by water used in dairies and taken from wells into which sewage

matters containing typhoid discharges have percolated. Epidemics of typhoid fever have been recorded which were due apparently to both the milk and flesh taken from animals suffering from the disease.

Of the incubation period and its phenomena, and of the causes which lead to variations in its length, but little is positively known. The author points out that the mode of infection, the temperature, as well as certain personal and constitutional peculiarities, exercise an influence in varying the duration of this period, and of these probably the latter factor is the most potent; the amount or concentration of the poison having but little influence, since the period of incubation is the same in mild as in severe cases. We do not think this view can be maintained or that it is justified by very many well-known facts, although the author supports it very ably. Surely *à priori* the large dose of a poison must act more quickly and more severely than the small one. Take a family, having nearly the same constitutional peculiarities and all receiving the poison from the same drinking water, it is difficult to suppose that the variations in the time and the severity of the disease as shown in the various persons can be due to any other cause than the amount of water, and consequently of the typhoid poison, taken.

In the second lecture on the *pathology* of the disease, the author divides the phenomena into two classes: first, those which are peculiar to typhoid; second, those which are common to it with other febrile diseases. To the latter class belong the high temperature, the tissue degenerations and wasting, and the functional disturbances, and these phenomena he shows are not separate, distinct, and independent factors, but most intimately connected. Each of these factors is at the same time, at least partly, the cause and the effect of all the phenomena. The diminished and disintegrating blood corpuscles cause imperfect nutrition of the glandular and muscular tissues, the degenerating nervous organs, whilst failing to regulate nutrition, at the same time contribute to the irregularities of the respiratory and circulatory processes. These degenerative changes, especially those affecting the heart fibre and nervous tissues, are of primary importance, as they are unquestionably the cause of nearly all the fatal cases of typhoid, but at the same time it is to be noted that these changes are not peculiar to this fever.

Since this wasting or degenerative process is so frequently the cause of death, and is so immediately due to the high temperature, the febrile process or phenomena become the most important consideration in the pathology of the disease. The fever is due to the processes set in motion by the presence of the specific poison in the body, yet the regulation of the temperature, both in health and disease, must be referred to the action of the nervous system. And here again we have all the factors of the morbid phenomena contributing to the disturbance of the heat function; none can be excluded, and we are not in a position to dogmatize with absolute certainty on the role performed by each of these altered conditions. In other words, the high temperature is not simply an effect of increased oxidation, conditioned by rapid tissue changes, but is largely due to imperfect dispersion of the heat produced. In fact, it is possible to suppose that in every elevation of the bodily temperature, the amount of heat actually produced is less than under normal conditions, and that the increased thermometric indication is due merely to the failure to radiate heat; while less heat is produced, still less than the normal amount leaves the body. The wasting of the body, said to be due to the "burning up"

of the tissues, may be accounted for by imperfect assimilation of food; this imperfect assimilation is especially present in typhoid fever owing to the intestinal lesions, and this accords with the fact that wasting is more pronounced in typhoid than in any other fever of an equal grade of severity.

Another very important point for consideration in the febrile process is the difference exhibited, after the application of external cold and heat, between the normal and febrile condition. Frequent repeated cold applications to a healthy man finally fail to reduce the temperature, whereas in fevers the hundredth repetition is as certainly followed by a diminution of bodily warmth as the first. On the other hand, the warm coverings to a fever patient increase the temperature, whilst in health the same extreme warmth fails to a great degree to cause elevation of thermometric registration. All of these conditions and phenomena, therefore, point out that the heat-regulating power is defective, and that in all probability the source or locality of the heat-producing activity of fever is not identical with that of health.

The correctness or otherwise of these views of the pathology of typhoid as well as of other fevers, is so important in the treatment that we shall give the author's statement of them in brief.

"The poison is swallowed and enters the system through the lymph follicles of the ileum, on which it produces its primary effects; it then passes into the mesenteric glands, where it goes through a stage of latency or incubation, and at last enters the circulation and produces the local lesions. The poison also acts on the heat-regulating centres and produces the febrile temperature. The high temperature in its turn causes all the other morbid phenomena. There can be little doubt but that the pathological changes and injurious effects of fever are largely due to the high temperature."

As the author very distinctly points out, although nearly all these phenomena may be ascribed to the effects of high temperature—the present German view of the febrile process—yet it can be distinctly shown that this opinion is too exclusive and contracted, and that it leaves out the factor originating the whole train of symptoms, viz., the action of febrile poison. It can be shown that the same kind of organic changes, though in a less degree, may result without the occurrence of fever.

Two other important features which are peculiar to typhoid receive considerable attention in the chapter on pathology, viz., the type and the duration of the fever. The type of typhoid, considered as a febrile process, is that of two distinct fevers: first, that due to the effect of the poison on the organism; secondly, that caused principally by the specific lesions of the intestine and the consequent septicæmia. The duration of typhoid is rendered extremely irregular, principally by the latter of these two phenomena. The initial fever is, the author believes, as regular in its course as that of most of the other zymotic fevers, although its duration is difficult of determination because, like some of the other fevers having a similar type, the secondary fever supervenes or overlaps on the primary, without the occurrence of a distinct remission. The duration of typhoid is rendered extremely varying by the secondary fever, in some cases it may be nearly or wholly absent; in others it becomes the main or at least the dangerous part of the disease.

Another cause of variation of duration is the striking tendency to relapses, which are apparently more frequent in typhoid than in other fevers. The author, after distinguishing between true and false relapses—between those

due to re-infection and those from improper diet, etc.,—believes that true relapses result from the absorption of the poison retained in the mesenteric glands and lymph follicles of the intestine—excluding of course such cases where it can be shown that the patient has been re-infected from his own discharges or poisoned water or food. This re-absorption, as the author says, probably takes place in all cases, but generally the system is protected and the zymotic process has been complete, therefore no relapse follows. Although this explanation has been rejected by many, we think it has been done on insufficient grounds. It is possible to maintain with certainty from post-mortem evidence that the follicles of the intestine, unsloughed, and even more surely the mesenteric glands, swollen to obstruction, retain portions of the zymotic material, which, as the glandular swelling subsides, must find its way into the circulation. If the amount of this material is large, a relapse results; if small, the “dose” of the retained poison fails to reproduce the febrile symptoms. Necessarily, if the active poison is retained in the glands, it must pass onwards into the blood, and its passage into the circulation must be sudden; if its amount is sufficient, a relapse is certain to follow. The suddenness of the onset of the fever in relapses, therefore, is in correspondence with the supposed anatomical basis of causation.

The third lecture, on the *Treatment*, is a plea to the profession for a return to the former philosophy in respect to fevers, viz., that something must be done to modify the febrile process itself. It is a claim put forward in behalf of some specific plan of treatment for fever, or rather the high temperature, in opposition to the expectant or rational method. The author calls it the antipyretic treatment of fever, which, as he shows, is not a new method, since it has been the aim from the time of Hippocrates to reduce the fever by various methods. But the specific plan which he recommends, it is claimed, is free from the objections that hold against bleeding, purging, sweating, emetics and calomel, all of which so evidently were harmful, so harmful that rational medicine by reaction adopted the expectant method as a protest against these errors. The antipyretic method, consisting of the application of cold, generally by means of baths, is itself by no means new, but the method was so much in conflict with prevailing notions that it was ignored. From the time of Dr. Currie until Dr. Brand, of Stettin, brought about its revival, this treatment has been used only occasionally, and indeed incompletely by a few eminent men, such as Chomel for typhoid, and Graves and Trousseau for scarlet fever.

The author applies two principles to the test of the success of this mode of treatment. First, whether it appears to relieve the urgent symptoms and to exercise a favourable influence on the course of the disease. Secondly, the test of statistics on the general rate of mortality. That the results of the test are favourable seems very evident, but to insure good results the principle underlying the treatment must be observed carefully throughout the whole course of the disease, and the temperature kept under a moderate fever heat (102.2° F.) from beginning to termination of the attack. This is to be effected by cold water applications, preferably the bath, supplemented by the use of drugs, as quinia, salicylate of soda, and digitalis. There exists an objection to the salicylate in that it is sometimes dangerously depressing on the action of the heart. The temperature of the bath may range from 65° to 70° F., its duration, varied according to the patient's condition and the effects produced, probably from ten to twenty minutes. It is to be repeated as often as the temperature rises to

the limit. Whilst exerting unquestionably a favourable influence on the general febrile symptoms, it does not affect unfavourably any of the special symptoms of typhoid, not excepting even the pneumonic and renal complications which occur with such frequency in the course of this fever. A plan of treatment which is shown to reduce the mortality from 16 per cent. to 7.4 per cent. (Brand), certainly has everything almost to recommend its further trial and adoption.

We regret that the author has not had something to say concerning the efforts to abort the onset of typhoid fever. After the reception of the poison into the system and the actual rise of temperature has taken place, almost all observers are agreed that prevention or cutting short of the disease is impossible, and that the means to such an end are useless, if not positively harmful. But during the incubation period there are many means to be employed in suspicious cases; not every dose of poison is fatal, neither should every drink of infected water develop typhoid fever. Few opportunities offer for careful observations during the time of incubation, but efforts should certainly be made in this direction in future. We regret that this subject should have been omitted by one so competent to deal with it.

It is impossible to criticize a book for omissions when the author does not attempt to make it full and complete. That a writer should not say anything new and original on the subject of typhoid fever is not strange, but as Dr. Cayley has brought together within so small a compass, so many well-attested observations of others, as well as many of his own, and withal so good a commentary of the whole, he has conferred a greater favour on his readers than if his theories had been newer and his propositions original and startling. Those readers, to whom the facts, here brought together, are known, as well as those who see them for the first time, cannot fail to read his pages with advantage and instruction, and will rarely find so much that is good or work so well done as in these lectures from his pen.

2. We welcome Dr. Irvine's pages now "reduced to order" by the author, from the contributions made to the *Medical Times and Gazette* during the year 1879. The subject of the relapses of typhoid fever, and the means by which they may be more certainly recognized, must be matter of very great interest to every physician. We are familiar with those cases of this disease, both severe and mild in character, which are described as dragging along with more or less return of fever after the expected time for convalescence. Such cases are variously and rather indefinitely spoken of commonly as cases of prolonged convalescences, as recrudescences, as unusual exacerbations or as relapses. To a great degree the true significance of such phenomena has commonly been very vague. Any contribution, therefore, to the clinical history and symptomatology of these conditions must be very welcome.

That true relapses with a return of all the symptoms—diarrhœa, fever, eruption, etc.—do occur, has been known with certainty for a considerable time, although still denied by some. We are much in need of further information of their pathology and of power and facility for their recognition. The author's endeavor is to supply us with a portion of this knowledge and to enable us to discriminate with accuracy between recrudescences of the primary attack and the irregularities and deviations of the disease on the one hand, and the true relapses, from which the special

danger of renewed ulceration of the bowel results, on the other. He claims also that relapses are much more frequent than heretofore supposed, and that too frequently they are passed by unrecognized.

The means which he discusses for the recognition of a true relapse is the thermometric record, while at the same time not claiming that such a recurrence of the disease is to be diagnosed by this means alone without a close conjunction of its indications with the symptoms. He points out that while a relapse has been defined as a "recurrence of the original attack, with all the phenomena of that attack," yet this is not an accurate definition, since the "relapse differs in many respects from the primary disease;" it bears, however, such a strong resemblance to the primary that we diagnose relapse through this resemblance—that we have a clear clinical notion of its nature without being able to form a strictly definite and accurate definition. He claims, moreover, that a true relapse may be distinguished from false relapses, and the true nature of the renewed disturbance established by the regularity of the temperature curve—that it is to be recognized by this means rather than from the eruption, stools, etc., which may not be typical either in the primary attack or the relapse.

A temperature-curve for the relapses of typhoid fever is as much to be desired and as valuable as a similar indication for the primary attack; a curve, regular in its irregularities and as typical for the one as the other, would be as striking an advance in our clinical knowledge as the original observations of Wunderlich, that each form or class of disease was characterized by a type of thermometric varieties of the bodily temperature. Wunderlich has given a few observations on the course of the temperature in relapses of this disease, but until now no systematic studies have been published. The author gives us the details of thirty-one cases, 19 of single or multiple, regular or irregular, relapses, and 11 of examples of recrudescence or of conditions likely to be confounded with relapse, and to these cases are appended twenty-one temperature charts.

The course of the temperature as shown by these records is generally as follows, subject, of course, to similar modifications and variations without known causes, as observed in the primary attack. After convalescence from the primary attack has commenced, and the temperature fallen to normal or even subnormal, a varying period elapses, and then suddenly and unexpectedly the temperature rises again. The apyrexial period in eight cases of "simple" single relapse varied from a few hours (only perceptible by the thermometer) to eight days, averaging a little over four days. From this the temperature, with little intermission, rises and reaches a maximum with striking regularity on the fifth day; up to the eighth or ninth day it is nearly steady, and then usually falls several degrees even to a subnormal grade; from this grade it usually rises, even quite high, but in simple cases this rise is, so to speak, ephemeral. After this the temperature shows in a modified degree the great oscillations of the terminal period of the primary attack. In the nine simple relapses of the author, all terminated within the twenty-first day by subnormal temperature.

The observations of others, as well as our own, in the main agree with this temperature record; Da Costa, who has, so far as we know, recorded the most extensive experience in the relapses of typhoid fever, speaks of its temperature peculiarities as follows. "Unlike the graduated ascending course until the evening of the fourth or fifth day, which is the rule in ordinary instances of typhoid fever, the temperature bounds within twenty-

four hours to a decided fever temperature, remits 1° to $1\frac{1}{2}^{\circ}$ the next morning, and by the evening of the second day is a degree or more higher than on the first day, the thermometer very commonly marking 104° . Then for from five to seven days, according to the severity of the attack, the evening figures read about the same; and a morning remission of about 1° , or somewhat more, happens. Subsequently the temperature in a zigzag manner approaches to the normal, that we observe in typical cases of the typhoid attack. Yet, until convalescence is established, local complications arrest or reverse the daily descent. Neither do we always find during the height of the relapse, that the temperature is as regular as described. It may sink almost continuously for the first three days after it has reached the height occasioned by the returning fever, and then for three or four days more gradually ascend without any morning remission, yet subsequently, as defervescence sets in, show the characteristic zigzag decline alluded to." (*Trans. Coll. Physicians Phila.*, 3d s., vol. iii. pp. 105-6.)

In respect to the apyrexial period, observations and opinions are naturally indefinite; because, in the first place, not expecting a recurrence of the disease, the thermometric record, both at the end of the primary attack and at the commencement of the relapse, is not unfrequently omitted; and secondly, the standard for the termination of the primary attack is uncertain, some considering it ended by the occurrence of a subnormal temperature, others only when the symptoms have disappeared, although previously the thermometer has shown an absence of fever. The author's cases show an apyrexial period of, on an average, four days. Murchison speaks of ten to twelve days as a common interval, but refers to the relapse overlapping the primary attack without an appreciable apyrexia. Da Costa says, "the relapse generally comes on in the second or third week of assured convalescence, and in the second oftener than the third. It is not, I find—and in this the dissimilarity to the first attack is marked—preceded by the prodromic symptoms so common in typhoid fever."

It would seem, therefore, from the careful thermometric observations here alluded to, that the temperature curves of the relapse are, with variations, as typical for this condition as the curves for the primary typhoid attack, but that the time intervening between the primary and the relapse is not a characteristic feature.

The author's observations, he contends, go further than to show merely a typical course of the temperature for relapses. He claims that typhoid fever and cases of its relapse are much more frequent than at present believed; that through the absence of conspicuous symptoms, especially the diarrhoea, the primary attack remains unnoticed; and that the nature of the disease is first recognized, either from a greater severity of the symptoms or a long continuance of the illness, and only comes under treatment during its relapse. This relapse is to be distinguished and differentiated from a primary attack by the characteristic fluctuations and the duration of the fever as evidenced by the thermometric record. Such instances are furnished by "ambulatory" typhoid, in which, perhaps, relapses are especially frequent, although by no means confined to these cases. He further claims that relapses of the third and even fourth degree have hitherto been entirely overlooked, because unknown or wholly masked by the prominence of complications; these later relapses have their identity established by their own characteristic temperature curves, which differ but slightly in their prominent features from the early relapse, although there is a tendency exhibited in the later ones to a progressive shortening of the duration of the pyrexial period.

Other writers, however, speak of second and even third relapses. Murchison quotes Stewart, Trousseau, Wunderlich, and MacLagan as having observed these rare cases, and he mentions two cases occurring under his own care. Da Costa mentions a case where "this third attack (relapse) became much protracted by intense pulmonary congestion, and several violent intestinal hemorrhages happened after the sixty-sixth day of the original seizure" and ended by recovery. We have seen that, as yet, the basis for the recognition of the relapse is a very narrow one so far as it rests on thermometric observation. How much more scanty is our information in respect to second, third, and fourth relapses!

While it is essentially true, that, if a given train of symptom, with a characteristic temperature curve is present, it is difficult to come to any other conclusion than that, in this case, for example, we have to deal with a return of the disease or a relapse, still it must be carefully borne in mind that typhoid fever was not differentiated from other febrile diseases by its temperature (at that time thermometry was not studied), nor even by its symptoms, but its nature was first pointed out by its morbid changes studied in the post-mortem room. The same criterion must be made as well for all other diseases as for the relapses of typhoid fever. Supplied, however, as we now are with both the pathological appearances and the symptoms, the problem is a simpler one by far than the original discovery or elucidation of the disease, but still we are not at liberty to speak of a relapse of typhoid fever, much less of second, third, or fourth relapses, without in the first place being certain that our anatomical foundations are clear and distinct. As yet, the basis of the recognition of relapses, from a clinical point of view, is a very narrow one, and even more contracted is our knowledge of their anatomical changes.

The definition of relapse is an uncertain matter, and to make out of it anything more than a curious complication or, at most, a recurrence of the original symptoms, it is necessary to understand very definitely what is meant by a return of the disease. Do we mean a reinfection of the patient either, as some believe, by internal causes, or, as others hold, from external sources? Does the idea include also a redevelopment of the peculiar intestinal lesion in a new set of Peyer's patches, or is it only a new exhibition of the "ferment" changes of the blood, unattended with the peculiar danger from the ulceration of the bowel? According as we accept one or the other of these views, or, to state the question on its true basis, according as we find some anatomical foundation of their truth existing or none, necessarily our methods of treatment, as well as our efforts for the prevention of relapses, must be governed. To determine the question of the nature of the relapse, not so much its cause as its morbid changes, we must rely upon the appearances presented by the intestine. The author reports three cases of fatal relapse, and states in the *post-mortem* record "that Peyer's patches were affected as in ordinary cases of typhoid fever, and that there was nothing in the intestine to separate by morbid appearances relapse from primary attack." Dr. Murchison speaks of "lesions farther from the ileo-caecal valve with healing of old ulcers lower down" as the conditions found in the cases observed by himself, and such were the appearances found by ourselves in the post-mortem of two cases in which relapse of typhoid fever had been diagnosticated. *A priori*, this is what we should be led to expect as the probable natural state in cases of relapse, but unquestionably a much larger number of cases than those as yet reported are required to furnish even the clue for the commencement of the study of the question.

We have attempted only to point out the course that the investigations should take in resolving with certainty this very interesting study, and have given very briefly a few of the points which the author has discussed in connection with the relapse of typhoid fever and its repetition. A criticism of the results of his labour, which extended over several years, on a subject as yet so new and so little explored, is manifestly out of the question. That the work of observation as given here by the author, in relation to the temperature attending the peculiar train of symptoms, has been well and faithfully done is apparent in every recorded case, and the spirit—the truly scientific spirit in which it has been accomplished, cannot be too highly praised. The settlement of the question and the reality claimed for the phenomena must be deferred until more materials are at our disposal.

A word further must be added in respect to the author personally. On the same page with his preface there is notice that Dr. Irvine died before his book was presented to the public. “It shows a true and earnest devotion to the profession which he had chosen,”—“the foreshadowing of what might have been, had longer life been granted to him who is no longer of us.”

M. L.

ART. XL.—*Paralysie Vaso-motrice des Extrémités, ou Érythromélagie.* Par MAURICE LANNOIS, Docteur en Médecine de la Faculté de Paris. 8vo. pp. 71. Paris: J. B. Baillière et Fils, 1880.
Vaso-motor Paralysis of the Extremities, or Erythromelalgia. By Dr. MAURICE LANNOIS.

IN this monograph of 71 pages we have a meritorious presentation of a little known subject. Vaso-motor paralysis of the extremities or erythromelalgia is the disease to which Dr. S. Weir Mitchell first drew general attention by an elaborate paper published in the *American Journal of the Medical Sciences* for July, 1878, although prior to this publication Graves, Grenier, Sigerson, and Vulpian had reported cases. Dr. Lannois uses freely the article of Dr. Mitchell, quoting in full his original cases and many of his observations, not failing, however, to give full credit. He gives in detail also one case observed by himself in the service of M. Straus.

The disease usually attacks men. It begins as a burning pain in some part of the foot or feet, as a rule, although the hands are sometimes attacked. The character and qualities of the pain are described. The most striking peculiarity, after the pain, is the flushing or congestion of the parts. The congestion is active and is accompanied by elevation of temperature. The pain and other symptoms are relieved by the horizontal position and by cold. Sensibility and the reflexes are usually preserved or increased. The muscles retain their volume, and respond well to electricity. Troubles of sight and hearing are occasionally observed.

Some of the affections from which erythromelalgia is to be distinguished are cyanosis from disease of the heart, acrodynia, ergotic gangrene, rheumatism, and podynia, but from none of these will the diagnosis be found difficult. In heart-disease we have the general cyanosis, the cardiac murmurs, the dyspnoea, and the œdema of the lower extremities to help us to a decision. Acrodynia was epidemic in France in 1828,

1829, and 1830, and since has occurred sporadically. Its chief manifestations, as given by Mitchell and Lannois, were vomiting, diarrhoea, œdema of the limbs, redness or splotches of the feet and hands, pain, burning sensation, dysæsthesia of the palms and soles, sometimes cramps, local spasms, and loss of power. Gangrene from ergot is usually symmetrical, and occurs in epidemic form among the lowest classes. Rheumatism may be difficult to differentiate from erythromelalgia when it is localized in the small articulations of the extremities. In making a diagnosis we are to be guided by the well-known course of rheumatism, and by the manner in which it yields to treatment. Podynia is a disease described by Gross as peculiar to tailors. It is characterized by an aching or burning pain in or about the soles of the feet. Gross believed it to be due to a subacute inflammation of the periosteum; but Mitchell ascribes it to a low grade of inflammation of the joint surfaces of the feet.

One of the most interesting parts of the pamphlet is that in which erythromelalgia and local asphyxia and symmetrical gangrene of the extremities are contrasted. The two diseases present exactly opposite characteristics, as is shown by the following table:—

LOCAL ASPHYXIA AND SYMMETRICAL GANGRENE.

Women are attacked in four-fifths of the cases (M. Raynaud).

The least age is 25 years.

Ischæmia predominates; arterial pulsations are not present.

The skin is livid and shows a characteristic cyanotic hue.

There is always anæsthesia; sensibility is blunted notably, or may be even annihilated.

The temperature is always below the normal.

Gangrene is ordinarily the termination of the asphyxia.

The attacks are more frequently produced under the influence of cold.

The disease is symmetrical.

ERYTHROMELALGIA.

Nearly all the cases reported have been men (11 out of 14).

The least age is 35 years.

Turgescence and congestion are the rule; arterial pulsations are very violent.

The skin is red or violet, the colour is always bright and animated.

Sensibility is often normal; hyperæsthesia is sometimes observed.

The temperature is markedly increased at the time of the attack.

As a general rule trophic troubles are not present.

The attacks are more frequently produced under the influence of heat.

The disease may be asymmetrical, and when two members are stricken, one or the other is generally more affected.

All the evidence, clinical and pathological, would seem to favour the view that in erythromelalgia we have a paresis or paralysis of peripheral vessels, and in local asphyxia and symmetrical gangrene peripheral vascular spasm. Thrombosis, embolism, or degeneration of the arterial walls sufficient to produce obstruction of the vessels, has not been found on dissection of the limbs in cases of symmetrical gangrene.

The following are the conclusions of M. Lannois:—

“1. There exists a *vaso-motor paralysis of the vessels of the extremities or erythromelalgia*, which should take its place in the nosology by the side of local asphyxia and symmetrical gangrene of the extremities described by M. Maurice Raynaud.

“2. This rare affection is characterized clinically by accessions of pain accompanied by swelling and redness of the skin, with notable elevation of temperature.

“3. The march of the disease is always slow, and its duration, always long,

is uncertain. It has periods of remission and exacerbation of its symptoms according to the seasons, winter diminishing the troubles, summer increasing them in a remarkable way.

"4. Its diagnosis does not present any very great difficulties, and it is probable that the affection will become more common when it is better known in its clinical manifestations.

"5. Its nature is still undetermined; it seems to be related either to disorders of the functions of the medullary vaso-motor centres, or rather to some modifications, still undetermined, undergone by the numerous peripheral ganglia which exist near the terminations of the nerves in the vessels and which preside in part over their innervation."

Although the monograph contains but little original matter, it deserves commendation as a careful systematic study of an important local vaso-motor disorder.

C. K. M.

ART. XLI.—*La Pella* in *Italia*. Annali di Agricoltura, No. 18, 1879. 8vo. pp. 502. Rome, 1880.

PELLAGRA, from *pelle*, skin, and *agra*, rough or harsh, may be denominated the national disease of Italy, as nearly 100,000 of her inhabitants are the subjects of it. It is not exclusively confined to Italy, as it is found to some extent in Spain, France, Poland, the Danubian Provinces, and Algeria; but it is far more abundant there than in any other country, and mainly in the northern provinces, there being very few cases south of Rome. On several occasions reports have been made upon it by the government, and the volume under our consideration is a census of the disease taken in all the provinces where it prevails.

It is one of the diseases of enervation, and results from poverty, ignorance, unwholesome diet, impure air, and bad water. An attempt has been made to trace its origin to the effect of a maize diet, but like the blindness of the Egyptians and orientals attributed to the use of rice, the opinion has failed from want of evidence. Indirectly, the diet of Indian corn, as prepared by the Italian peasantry, has much to do with the production of pellagra, but this is not due to any peculiar effect of the grain itself, or to any parasitic vegetable located upon it. Several varieties of maize are in use in Italy, and in some of the provinces where it is the chief diet the disease does not prevail. It is also prevalent in some localities where maize is but little used.

The habits of the Italian peasantry; their diet of corn-polenta, which is often sour and unfit to eat; their damp cabins; want of cleanliness; their winter residence in cow-stables; impure drinking water, and lives of toil and privation under an imperfectly sustaining diet, combine to produce a condition of system which favours the appearance of pellagra on exposure of the body to the influence of the sun's rays.

Pellagra is a singular disease, commencing in March or April as a solar erythema on the exposed parts of the body, it advances to a squamous stage, and late in the season disappears, to be renewed with increasing severity each spring. In time the dermal manifestation is overshadowed by its associated intestinal disorders which become the chief feature; then nerve troubles are superadded, the brain becomes affected, the patient shows signs of insanity, running on to melancholia with a suicidal propensity, and finally becomes, in the worst cases, paralyzed. Pellagrous

insanity abounds in the insane hospitals of northern Italy, and suicide, especially by drowning, is a common effect of the mental alienation. Although originating in poverty and privation, the disease may, by heredity, affect those of a better class in the next generation; to check such a national scourge is, therefore, a matter of vital importance to Italy, in which there were in 1879, 97,855 cases, in a total population of 26,801,154.

Under the name *Pellarella* the disease was treated in the well-known Ospedale Maggiore of Milan more than 300 years ago, and special arrangements were made (1578) for the admission of cases; but the malady was not minutely described until 1750, when Gaspar Casal, who had for twenty years observed it in the vicinity of Oviedo in Spain, did so under the name of *mal de rosa*. Although long known in Italy, it was not until 1771 that any one made it the subject of a monograph, which was the work of Francesco Frappoli of Milan, the disease in that year having been unusually prevalent. In 1784 a special pellagra hospital of 60 beds was opened in Milan, and at a later date the disease spread over a large part of Italy, even down to Naples, where ordinarily it does not exist.

More than 300 monographs on Pellagra have appeared during the last 130 years, chiefly in the Italian language, although perhaps the best and most comprehensive treatise is in the French tongue.¹ It has borne a score of titles, such as the *Alpine Scurvy*; *Mal de la teste*; *Mal del Miseria*, etc., and the government report under review gives a chronological catalogue of 285 of them.

The disease as stated is chiefly confined to the northern provinces of Italy, and is particularly abundant in what was before the union the *Lombardo-Venetian Kingdom*. It does not in ordinary times extend south of the former *States of the Church*, and does not exist in the two adjoining provinces of Siena and Grosseto, unless very exceptionally. It prevails to the largest extent in the four provinces of Brescia, Piacenza, Padua, and Ferrara, where there are more than 50 pellagrous subjects, male and female, to each 1000 of the agricultural population of 15 years of age and upward. In the provinces of Milan, Bergamo, and Venice, there are from 30 to 50; and Udine and Vicenza, 20 to 30. In times of great scarcity, the proportion increases; and when food is cheap from abundance, there is a marked diminution, as the very poor are able to obtain a better diet.

The object of preparing the Pellagra report of 1879 was to determine the causes of the disease, the measure of its prevalence, and, if possible, to devise means for checking or removing it. It is proposed to ameliorate the condition of the peasantry; for which purpose it is recommended that they should be instructed as to the causes of the disease, and induced to raise rabbits for animal food. They are to have better houses, with more light and air admitted; eat less corn food and more leguminous and vegetable articles; consume a portion of wine, milk, and meat; have their maize kiln-dried and kept free from moisture; avoid matrimonial alliances with pellagrous families; and as a last resort to emigrate.

It is not stated what country is recommended as a recipient for these pellagrous peasants, but in all probability, if the plan is carried out, we shall in time have a share of them in our own. Dr. Salvatore Caro, of New York, thinks that a change of region only is intended, but the term used implies simply emigration, and occurs in a number of tables as the

¹ Dictionnaire de Méd. et Chirurg. Pratiques, article *Pellagre*, by Henri Gintrac. 8vo. pp. 45. Paris, 1878.

final expedient. In the event of the failure, by amelioration, etc., emigration is to be the *dernier ressort*, as we understand it. In some of the paludal regions of Italy, miasmatic fevers, malacosteon, and pellagra are all prevalent; but the last appears to depend more upon an imperfect diet than paludal influence. Both malacosteon and pellagra are diseases of imperfect nutrition, but one may prevail without any appearance of the other. The Cæsarean section in Italy has been most abundant in the northern cities, but has also been performed for pelvic deformities in a large number of instances in the non-pellagrous districts, as for instance 27 times in Naples.

Dr. Caro, who has been in practice twenty-eight years in New York, writes to the reviewer to the effect that he has never met with a case of imported pellagra among his Italian patients. He has seen but one instance of the disease, and that began in this country under a syphilitic influence, and came under his care in 1878. As pellagra is inherited, it is possible that the syphilis in this instance attacked a subject already tainted with a dormant pellagra. No cases of the disease have been noticed in the inspection of emigrants at the New York quarantine during the past ten years. Dr. Piffard some years ago met with a case in the Hospital for Venereal Disease in New York, which he believes to have been pellagra. Dr. Duhring, of Philadelphia, has not seen a case outside of Italy.

The question of interest to the profession at large is, can pellagra be cured? Will an improved diet and mode of living remove the disease, or rob it of its severity? Would pellagrous Italians, if removed to the United States, be likely, with their early training and ignorance, to alter their mode of living sufficiently to escape the influences which have in Italy produced the disease? No doubt the reason for the non-arrival of pellagra in our country is that the subjects of it are too wretchedly poor to emigrate, or even to remove a short distance in search of a more healthful locality. Should the government aid them to emigrate, the question of climatic influence will soon be settled. Such subjects are not at all desirable unless they can be cured by coming among us and adopting our mode of living. If beyond remedy, they would be but little more acceptable than the Chinese leper.

R. P. H.

ART. XLII.—*A Treatise on Albuminuria*. By W. HOWSHIP DICKINSON, M.D. Cantab., Physician to St. George's Hospital; Senior Physician to the Hospital for Sick Children, etc. Second edition. 8vo. pp. 300. New York: William Wood & Co., 1881.

SINCE the first edition of this work (1868), which was reviewed in the number of this Journal for April, 1868 (p. 458), the reputation of Dr. Dickinson, as a skilful physician, and as a medical author, has very justly increased, and this work, as it has come to be more widely known, and as its teachings have been carefully tested by observation and further experience, has been more highly valued. A second edition has been demanded just as second editions of all good books are demanded, and also that the student might be informed of the later views and further observation of the author on many points in the pathology of albuminuria,

to which he has given diligent study, and to an increase of our knowledge of which he has contributed materially.

In the second edition Dr. Dickinson has inserted two additional chapters, one "On the Condition of the Heart and Arteries in Chronic Renal Disease (Chap. XIX.), the other "On the Retinal Changes Common to Albuminuria" (Chap. XV.); and besides this many alterations and re-statements of his former teachings have been made which bring the doctrine of renal pathology, as found in his book, into accord with the recent advances, much of it the result of his own labour, and make the understanding of the subject much clearer. Several plates or figures have also been added, as well as illustrative cases of the disease, which serve to make clear and to enforce his later views. Dr. Dickinson has altered his nomenclature "at the bidding of the London Pathological Society," and has given up the name which he formerly used, viz., *depurative* for the so-called amyloid infiltration, and now calls it the lardaceous kidney.

It is our purpose only to speak of the new matter found in the second edition, as the views inculcated in the first edition have been very fully placed before the readers of the Journal. In the chapter on the changes in the heart and arteries which are so constantly found in cases of contracted kidney or other chronic renal disease, the author gives the various opinions which have been advanced to explain the hypertrophy of the left ventricle: First, Bright's view of the difficulty the blood experienced in traversing the general capillary system by reason of the impurity due to defective renal action; secondly, that the difficulty in the passage of the blood was not due to its altered quality, but merely to the resistance encountered in the diseased kidney, and points out the impossibility of maintaining either of these theories. He then speaks of the arterial changes, which had early been noted by Bright, and gives the views of Dr. George Johnson, who developed the theory that the changes in the heart and in the arteries were the results of a mutual antagonism, and especially insisted on the fact that the changes in the walls of vessels were a true hypertrophy of the muscular tissues; and then the observations of Gull and Sutton, who claim that the increase of the parietal bulk of the vessels is due to fibroid overgrowth, and is merely an associated condition with the fibrotic renal disease. They named the disease *arterio-capillary fibrosis*. This theory is diametrically opposed to the views of Dr. Johnson, who had previously denied not only that the granular kidney was due to an inter-tubular fibroid overgrowth, but that any fibrous inter-tubular tissue existed in the organ.¹

Dr. Dickinson considers the question of the vascular alterations under three heads: "First, their anatomical nature; secondly, the circumstances under which they occur; thirdly, the nature of the process, as far as can be fairly conjectured, by which the alterations are brought about."

He concludes that the affected vessels, generally the smaller arterioles, are often thickened in a sufficiently striking manner, and both the muscular and fibrous coats are involved. That the thickened muscular coat is also changed in texture; its nuclei shrink, lessen in number, and finally disappear, and fatty degeneration is frequent, and is early recognizable. The fibroid sheath he has seen to become wavy and thick, and finally swollen with translucent structureless exudation, which transforms the normally thin vesture into a bulky outer cylinder, equalling or surpassing the calibre

¹ Johnson's and Gull and Sutton's papers appeared in the Med.-Chir. Trans. for 1867 and 1872, respectively.

of the vessel. The muscular coat appears usually, though not always, to increase before the fibrous, and sometimes the former alone is increased. Dr. Dickinson also confirms the association, so constantly found, of the vascular changes, or at least the renal contraction, with hypertrophy of the left ventricle; his cases show a proportion of 74 per cent. in uncomplicated cases.

It is a strange fact that so opposite opinions, apparently well supported by observations, should have arisen concerning the condition of the vessels in renal disease, as well as to the cause of the simultaneous occurrence of the hypertrophy of the heart and the thickened vessels. The original view of Bright as to the cardiac hypertrophy, to whom the minute changes in the vessels were unknown, although he was familiar with their macroscopic alterations, was, for a long time, universally accepted; the changed quality of the blood, due to imperfect renal action, caused a hindrance in the passage of the blood through the capillaries, and to overcome this obstruction or retardation more forcible action of the left ventricle was necessitated; consequently its muscle hypertrophied.

Dr. Johnson's theory, that the antagonism of the vascular muscles is the cause of the cardiac hypertrophy, has not been sustained by other observers, and is probably directly opposed to their physiological action. We may therefore hold that this "stopcock" theory is improbable, especially as we do not find any other instance of a similar action on the part of the muscular coats of the arterioles, by which they act to prevent the entrance of blood into a diseased organ, because the organ is not in a condition to act functionally on the blood.

Dr. Dickinson, in his explanation of the cardio-vascular changes, reverts to the older theory of capillary hindrance due to the altered composition of the blood. He points out that the heart and arteries act in consonance in propelling the blood, that, through capillary hindrance, the vessels become overdistended and the blood-pressure within them increases, and that consequently both parts of the circulatory organs are stimulated to overaction; they possibly receive also a stimulating impulse from the irritative action of the contaminated blood. Habitual overaction is followed by hypertrophy. That the cardiac hypertrophy is not caused by the arterial thickening, but results, in common with it, from capillary obstruction, is, he thinks, shown by its development often before the corresponding changes in the arteries are distinguishable. He also cites the case of lardaceous disease in support of this view, where the arteries are much thickened, though not in the same way, and apparently as much obstructed, without the heart becoming hypertrophied.

The conclusions which he has arrived at, in respect to these points, are in brief as follows:—

The arterial thickening of renal disease is due to increase of muscle, together with degenerative and fibroid changes.

It is a true muscular hypertrophy of both heart and arteries, in consequence of the same hindrance in front of both; superadded to which there are changes in the vessel-walls due to increased pressure by the blood and the irritation by the morbid-constituents.

The cardio-vascular thickening is almost invariable with the granular kidney; it occurs in other forms of nephritis and with degenerations or destruction of renal tissue, unconnected with general fibrosis.

Fibrosis, general or local, is not the direct acting cause of the cardio-vascular changes. The cardiac hypertrophy arises simultaneously or per-

haps prior to the vascular change, the cardiac is apparently not so much a consequence as of common origin with the vascular change. The cardio-vascular changes are consequent upon renal inefficiency, and are due to capillary resistance and arterial distension.

The usual exemption of lardaceous disease from the cardio-vascular complication may be due to a lesser degree of alteration of the blood, consequent on smaller amount of retained renal excreta, as witnessed by the small liability to uræmia which this disease involves, and partly to the relief of the arterial pressure afforded by the abundant purulent discharges so constantly associated.

Since the second edition of Dr. Dickinson's work has appeared, there was published in this Journal,¹ by Drs. Da Costa and Longstreth, some "Researches on the State of the Ganglionic Centres in Bright's Disease," in which the causation of the changes in the heart and arteries is discussed. In this paper were reviewed the observations of previous writers on the subject of cardio-vascular changes; and, while confirming the conditions which are so constantly found in cases of contracted kidney in respect to the circulatory organs, they propose, as the result of their studies of the changes in the ganglionic centres, an entirely new explanation of muscular hypertrophy found in the walls of the heart and arteries. Their theory points to the probability of the muscular hypertrophy being caused by the stimulating or irritating action of the altered blood—altered either by the retention of urinary products or by some unknown constituent, "poison," or *materies morbi*—acting on the nervous tissues, whereby an overaction of the vascular muscles is induced, and the consequent hypertrophy of these tissues. The simultaneous, or in some cases the antecedent, cardiac hypertrophy is due to a similar cause acting on the special cardiac ganglia.

This explanation of the undoubted hypertrophy occurring in both the heart-muscles and the muscular tunics of the vessels traces the cause to a central origin, and would seem to be much more in accord with known physiological laws than any view heretofore presented. This theory offers a much more rational explanation of the exceptional cases of diseased kidney, with or without vascular changes, in which the heart does not hypertrophy, and also covers entirely the ground for explaining the hypertrophy of the vascular muscles in all parts of the vascular system, as well as in the renal vessels.

The only material difference which Dr. Dickinson reports in the condition of the vessels from what has already been detailed by other observers, is the degenerative changes. Other investigators have also spoken of vascular degeneration in chronic Bright's disease, but it is usually as an occurrence of late origin. Dickinson, however, speaks of it as among the first changes to be found in the smaller arterioles. On this point we think he is in error, and so thoroughly in error, that, if his statement is true, it destroys in great degree his theory of the cardio-vascular changes. It is almost impossible to suppose that an hypertrophic and a degenerative process should take place in the same tissue simultaneously. The cases in which he particularly details these appearances, and on which he apparently basis his statement, are not, if we understand them correctly, simple instances of contracted kidney, and therefore cannot be fairly given to support the correctness of his observations.

¹ Amer. Journ. Med. Sci., July, 1880.

The paper to which we have called attention, as broaching this new explanation of the cardio-vascular changes, has been brought before the profession so recently that no opportunity has been afforded for other investigators to test the correctness of the researches on which the theory depends, viz., the essential character of the morbid alterations in the ganglia, and until this work has been many times repeated, no opinion can be definitely expressed on the soundness of the theory promulgated from these observations.

Chapter XV., which is also presented for the first time in this edition, is "On the Retinal Changes common to Albuminuria." The author points out the fact that the optical changes, at least those due to organic disease of the visual apparatus, are probably the direct results of the arterial changes so frequently accompanying albuminuria, and that they are to be found with as much regularity as the arterial disease itself. They are local alterations, which, from their peculiarity of situation, are readily seen, but are not isolated changes.

Before speaking of the anatomical changes in the retina, he alludes to the transient defect of vision due, like many other of the symptoms of Bright's disease, to uræmic poisoning, and shows that this condition is essentially different from the organic alterations, although it may arise as a complication or accompaniment of the more permanent and visible disease.

Of the organic changes he speaks of three kinds, which, while they may all be present simultaneously, usually make their appearance in the following sequence: first, hyperæmia and serous infiltration; second, hemorrhage; third, maculation.

The œdema or infiltration shows as a diffuse milkiness, rendering the outline of the disk indistinct. This condition is an early effect of the disease, and is apparently the result of increased vascular tension, belonging either to the acute or chronic form of malady. It produces a mistiness of vision, begins somewhat gradually, varies with condition of the circulation, is susceptible of improvement by treatment, and even of permanent recovery, providing the kidneys are not irretrievably damaged.

The nature of the pathological process productive of this condition is somewhat uncertain, and various opinions have been held in respect to its essential cause. The whole train of retinal phenomena are usually spoken of as albuminuric retinitis, thereby implying inflammatory origin of the changes; yet most observers describe its appearances as though simple increased vascularity and its accompanying serous transudation were the basis of the process. It is probable that in some cases a simple œdema is present, while in others an inflammatory exudation takes place; and that in many instances both conditions are presented, but as so few examples can be obtained for pathological investigation, since patients rarely succumb in this stage of the disease, the decision of the question must rest in abeyance.

The retinal hemorrhages, so frequently found in albuminuric retinitis, occur at all periods of the disease, except the earliest. They vary very greatly in number and size; they occur suddenly, and occasionally are large enough to produce darkening of the field of vision; they may be present in one or both eyes, but usually in both; they are usually seen near the site of vessels, or grouped around the disk, though not symmetrical in position or simultaneous in occurrence. The associations with the other retinal changes, when unexplained by other causes, are very characteris-

tic, if not pathognomonic of renal disease. They are produced by several causes, which may act separately or conjointly. The retinal hemorrhages of the early stage of disease are to be traced to increased arterial tension, while those of later occurrence, like the cerebral hemorrhages, are due to the advanced vascular degeneration, conjoined with greater force of the blood propelled by the thickened left ventricle.

The maculæ, or white spots, are usually white or cream-coloured, and strongly reflect light; they are placed in the anterior layer of the retina, and conceal beneath themselves portions of the retinal vessels, although also found involving the whole thickness of the retina; they are apparently areas of fatty degeneration of the retinal tissue. By some they have been considered as a degeneration of the decolorized clots. The microscopic examination of the eye post-mortem shows either collections of large granular cells or an increase of the connective tissue of the retina, and degenerative changes of the vessels, besides the œdema and the hemorrhages; but the nature of the white patches, whether of inflammatory or simple degenerative origin, or their relation to the extravasations of blood, has not been thoroughly determined.

The association of the retinal changes with the different varieties of Bright's disease presents most important aspects both in its clinical and in its purely pathological relations. In the first place, it may be stated that the retinal changes, except the simple hyperæmia and serous infiltration, are indicative of a chronic renal disease, and are associated very much more commonly with the contracted kidney, and are rarely entirely absent in this latter form of kidney, in at least one of its stages of development. On the other hand, it would seem from recorded experience that nearly every form of Bright's disease, both the tubal or catarrhal as well as those acute and often temporary cases of the disease seen in pregnant women and in scarlatina, which end in complete recovery, may exhibit retinal changes, although the instances are of rare occurrence. In cases of tubal disease, as they pass on to a chronic form, the retinal changes do occasionally make their appearance and become permanent, although this connection is exceptional rather than the rule. In lardaceous disease of the kidney, retinal changes have also been observed, just as in this form of albuminuria we find an occasional association of this infiltration with hypertrophied heart and arteries.

The author's concluding sentences of this chapter are as follows:—

“Retinal hemorrhage and maculation, which are but results of the cardiovascular change, are distributed similarly to it. The evidence points with sureness to the conclusion that the retinal, like the arterial change, is not associated with any specific renal condition, but is the issue, direct or indirect, of the increased arterial tension, which loss of renal function in many shapes may entail.”

It would seem best, therefore, since there is no positive pathological evidence—except, perhaps, the so frequent association, yet not constant, of the retinal changes with fibrotic kidney or interstitial nephritis—that the term “albuminuric retinitis,” which implies an inflammatory origin of the disease, should be changed to “*albuminuric retina*,” as this name would indicate merely its association with albuminuria, and that it was caused by the degenerative processes accompanying this group of diseases.

M. L.

ART. XLIII.—*Drainage for Health, or Easy Lessons in Sanitary Science.* By JOSEPH WILSON, M.D., Medical Director United States Navy. 8vo. pp. 68. Philadelphia: Presley Blakiston, 1881.

IN this thin octavo Dr. Wilson, who is so well and favourably known to the medical profession, by his excellent work on "Naval Hygiene," offers his services to the public generally as a guide to the popular mind in its avoidance of some of the dangers which so commonly threaten life and health. Its author announces in the preface that his intention is to furnish an essay, "simple in style and language, brief but correct as far as it goes, with sufficient variety to make easy reading." These objects are fairly kept in view, although in some parts of the volume Dr. Wilson seems to have a little over-shot his mark.

The first chapter is devoted to the drainage of land, and is well illustrated with numerous wood-cuts, showing the various forms and arrangements of drains, drain-pipes, etc., and instructing the reader in regard to numerous practical points, respecting the removal of the ground water from the upper strata of the soil. Chapter second treats of the drainage of the farmhouse and the village, and inculcates the vital importance to human health of pure water supply, and above all freedom from stercoral pollution. Drainage of cities is the subject of the third chapter, and is so clearly, though concisely, discussed as to render it the most valuable portion of the book.

J. G. R.

ART. XLIV.—*The Practitioner's Handbook of Treatment, or the Principles of Therapeutics.* By J. MILNER FOTHERGILL, M.D., F.R.C.P. Lond., etc. Second American from the second English edition, enlarged. 8vo. pp. 647. Philadelphia: Henry C. Lea's Son & Co., 1880.

THE scope and attractions of Fothergill's "Handbook of Practice" are so well understood by our readers that we need do scarcely more than notice this edition which has been recently issued. The happy combination in this work of medical philosophy and medical practice, presented in the author's fluent and engaging style, has met with general approbation: it is a book which we turn to with pleasure after vainly endeavouring to interest ourselves in the severely utilitarian and laconic treatises of many modern writers. The present edition bears evidence of careful revision, and much new material has been added which decidedly enhances its value. Among the new titles we notice Functional Disturbances of the Liver, the Means of Acting upon the Respiratory Nerve Centres, the Reflex Consequences of Ovarian Irritation, When Not to Give Iron, and Artificial Digestion—all important subjects. The section on the Nervous System, Chapter XXI., does not, in our opinion, entirely come within the general plan of the work, in its present form at least; although the section has been increased by one-third since the last edition, it might yet be extended with advantage. In the discussion of hysteria we do not observe its relationship to improper diet and "nervous" dyspepsia; in its therapy we miss the rest-cure of Weir Mitchell. Chorea might also be considered at greater length so as to include acute chorea occurring after zymotic

diseases or rheumatism in children, as well as that which appears in pregnancy; and the indications for treatment in chorea deserve more mention than they receive; while under epilepsy we fail to perceive a recognition of the value of ergot so well supported by Seguin. We mention these minor points not because we consider them vital, but because we like the book so well that we would have liked to have had it better. The second part of the work, on Public and Private Hygiene, and on Food in Health and Ill-Health, deserves to be thoroughly impressed upon the mind of both physician and patient, but particularly the former. Few practitioners will read it without acquiring some hints of value to them in their daily work.

F. W.

ART. XLV.—*Visual Power and Colour Perception in Railroad Employés. Third Annual Report of the State Board of Health of Connecticut for the year ending Nov. 30, 1880. Hartford, 1881.*

As is well known, the Legislature of Connecticut at its last session passed a law requiring all railroad employés employed in running the trains to be examined in relation to their acuteness of vision and colour perception. The execution of this law was intrusted to the State Board of Health, and the present report contains the results of its operation—the first experience of the kind in this country.

Two standards of requirements were adopted: one for the first class—composed of engineers, firemen, and brakemen; and one for the second class—including all other employés. For the first, healthy eyes with normal acuteness of vision ($\frac{20}{xx}$) and entire freedom from colour-blindness were required; for the second, visual acuteness of at least $\frac{3}{8}$ in one eye and of $\frac{1}{2}$ in the other, and freedom from colour-blindness in one eye and colour perception of at least $\frac{3}{4}$ in the other eye. Holmgren's worsted tests for colour-blindness were used, and Donders' quantitative tests with reflected spots and transmitted light.

The violent opposition with which the attempted execution of the law met from the railroad men and their friends, and the hue and cry that was at once raised by the politicians and the newspapers, are familiar matters of history. They demanded an entire change in the methods of examination, and clamoured particularly for practical tests by flags and lanterns. In obedience to this popular "pressure," the following modifications in the rules were made: brakemen were transferred to the second class; the standard of visual acuteness was reduced to $\frac{2}{3}$; and those failing in colour perception by the worsted test were allowed to be further tested by flags and lanterns at a distance of 80 rods.

1950 men were examined, of whom 68 were found colour-blind, and 196 with defective vision. 29 were absolutely refused certificates, 9 left voluntarily, some special certificates were granted at the option of the board, and in a number of cases the occupations of the men were changed. Brakemen found deficient were transferred from the front to the middle of the train, where hearing is more important to them than sight. Some interesting practical points were developed by the examinations. Of 43 men who failed by Holmgren's test, and were re-examined, 40 failed also by the flags and lanterns, and only three guessed correctly; and complaints and appeals against the flag and lantern test have been as numerous and

as bitter as against the "fanciful and theoretical tests" of the scientific examinations.

As a plain matter of fact it will not be possible to devise a test which will meet with the approval of those who fail to pass it, and the Connecticut Railroad commissioners, who are entirely correct on this question, truly say, that "had the result proved that there was no necessity for the law, no complaint would have been heard, for universally the men who have passed the examinations say that no man who cannot pass them is fit to run a train." Even if the flag and lantern test were practicable, without great loss of time, where a large number of men are to be examined, it has been shown to be entirely unreliable, particularly when applied by unprofessional persons. Dr. Carmalt gives a striking illustration of this fact; when he showed his orders to the President of the New Haven and Northampton Railroad, which runs into Massachusetts, he was crustily informed that the law was a nonsensical one, that the Massachusetts commissioners had attended to the matter, the employés had been examined under their instructions (by the assistant superintendent), and there was not a colour-blind man on the road. Dr. Carmalt, however, found a much larger percentage of colour-blind on that road than on any other—7 per cent., or nearly double the average. Dr. Carmalt states that, in all his examinations, he found only one man colour-blind of the first class (engineers and firemen), over thirty-two years of age, the average being thirty-one, while the average age of their class is thirty-six, and that "these men are actually eliminated from the service before they reach the average age of their class by a further experimentation with the lives of the passengers and the property of the company."

So little attention has hitherto been given to the subject, that it is not easy to point out instances in which accidents have certainly resulted from colour-blindness, but a striking case has recently been brought to light. A collision occurred, several years ago, between the tug-boat Lumberman and the steamer Isaac Bell, near Norfolk, in which ten lives were lost. The coroner's inquest developed no definite result; but it was supposed that one of the pilots was drunk. The pilot of the Lumberman was recently examined by a marine hospital surgeon and found to be colour-blind, and it is reported that the other pilot has the same defect. In the investigation of the famous Norwalk draw-bridge accident, it was shown that the red signal was properly displayed, but disregarded.

To the unprejudiced and unpolitical observer it would seem that the *raison d'être* of this Connecticut law had been more than established by its brief history. Unfortunately, some of the statesmen at Hartford appear to take a different view of the question, and are bringing all their energy and eloquence to bear for its repeal. Both sides have recently been heard before a Railroad Committee of the House, who have reported the following bill: "The railroad superintendent, the superintendent of motive power, and a surgeon approved by the Railroad Commissioners, shall be a board to examine railroad employés." But it is feared that even this is likely to be defeated in the Senate.

Dr. Jeffries is now perseveringly "agitating" the Massachusetts Assembly with a view to obtain legislative action in reference to examinations for colour-blindness among railroad employés and navigators.

G. C. H.

ART. XLVI.—*How a Person threatened or afflicted with Bright's Disease ought to live.* By JOSEPH F. EDWARDS, M.D. 12mo. pp. 87. Philadelphia: Presley Blakiston, 1881.

THE little book before us calls for but brief notice. Its pages are intended especially for the patient's, rather than the physician's, reading. The author has divided his remarks into four parts: the first part is devoted to "General Remarks" on Bright's Disease, intended to show its relative frequency at present and in former times; part second is on the physiology of the kidneys; part third, the nature of Bright's disease; and the last or fourth part, containing the chief object of the book, is devoted to the "Rules of Life."

It has been said that no task is more difficult than to write a book for children, and next to such an undertaking comes writing a scientific book for unscientific readers. Children are too often furnished with reading matter, which they do not want, but which their elders think they should have; writers on science supply their readers with the half-truths or inaccuracies of knowledge greatly to the detriment of intelligent progress. The failures in writing books of a so-called "popular" nature, or having for their purpose the instruction of the public, are due generally to this fault, and we are sorry to have to note in the first three parts of this book many errors of this sort. We think that these inaccuracies must have been made through carelessness or from the too common feeling that anything in science is "good enough for the public," because, in the last part, on the matters which concern the readers, and of which they are supposed to be judges, no fault is to be found.

Of the "Rules of Life," the professional reader can but praise them very highly; the author's facts are clearly given, his opinions are accurately reasoned out, and very plainly and forcibly expressed. Medical writers on Bright's Disease would do well to take instruction from this part of the book, and borrow a chapter for their future publications. Too frequently this portion of the discussion of this disease, as well as of most others, is passed over with only casual allusion, whilst it is, as our author shows, of the highest importance to the well-being of our patients, and in comparison with which drugging is of but little value.

We are prepared to praise the author's work in respect to the principal object for which it was undertaken, viz., how to live in Bright's disease, but we claim that no one should come before the public with any facts of a scientific character which are not strictly accurate, and which are not fully substantiated; all unsettled and debatable questions can be, from the nature of such books, easily omitted. If the next book, which the lay reader takes up, contains a different statement, or if the statistical tables prove an opposite proposition, doubts at once arise, not only of both these books, but of all other scientific results; not only are the purely scientific matters discredited, but the portions intended for the public's instruction or direction fail to produce the desired results. Such, we fear, may happen with parts of this book.

Should the brochure go to another edition, and we hope that it may, we trust that in the revision the author's attention will be given in the direction indicated.

M. L.

ART. XLVII.—*Diagrams of the Nerves of the Human Body*. By WILLIAM HENRY FLOWER, F.R.S. Third edition. 4to. Plates vi. Philadelphia: Presley Blakiston, 1881.

The first edition of this work, issued in 1860, was a large folio, and its merits as a means of study were speedily recognized. The second edition of 1872 and the present are so reduced in size and therefore in price that they may be had by every one. As the American reprint has been out of the market for some two years, and will not be reissued, we commend the present edition most fully to the profession. Both doctor and student will find the plates invaluable in refreshing their memories on many points so easily forgotten, and yet so important to recall. Professor Flower has done great service to teaching not only by the original plates, but by the more convenient and cheaper later editions. W. W. K.

ART. XLVIII.—*On the Operative Treatment of Hare-lip*. By W. J. WHEELER, M.D., M. Ch. Univ. Dubl. 8vo. pp. 40. Illustrated by 14 chromo-lithographs. Dublin, 1880.

THIS brochure, a reprint from the *Dublin Journal of Medical Science*, contains the records of fourteen cases of hare-lip, of various degrees of complexity, operated upon by the author; as well as a short account of the development of the jaw. The illustrations of the instruments employed and of the patients before and after operation are very realistic; the latter are chromo-lithographs. It seems to the writer, however, that at the short time after operation that these were drawn there should be more appearance of scarring than is seen. The author describes one case of median fissure, which is, of course, a rare occurrence. He prefers the scissors to the bistoury in paring the edges, uses compressors to control the coronary arteries, and, as a rule, operates within three months after birth. When there exists a projecting intermaxillary bone it should, in his opinion, be bent into place, and perhaps secured by an interosseous suture. The reporting of the cases is, in many instances, too verbose, the literary style of the author not above criticism, and the generalizations too limited; nevertheless, the work is a contribution to the literature of the deformity that will interest many surgeons. J. B. R.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

Elasticity of Arteries.

THE elasticity of the arteries, though it is well known to exert a powerful influence on the circulation of the blood, has hardly been studied with the attention it deserves. Ed. Weber was the first to institute the ingenious comparison between the elasticity of the arteries and that of the air in the air-chamber of a fire-engine, and to show clearly that its principal action is to convert the intermittent flow caused by the rhythmical contractions of the heart into a comparatively uniform and continuous current; but few have occupied themselves with determining with precision the degree of elasticity in particular vessels, the extent to which they yield on pressure, and their resistance to rupture. Moens, indeed, found that the elasticity was equal in the longitudinal and transverse directions, and that its co-efficient increased with the weighting. Volkmann observed that the carotid of a sheep sustained without rupturing a pressure of 2.25 metres of mercury, which is about fourteen times greater than that of the ordinary blood-pressure. All experimenters agree that the elasticity of the arteries is very perfect, though small; that is, that whilst they are easily extended or compressed according to the mode in which the force is applied, they recover their original form very perfectly.

Dr. Roy has just made an important communication to the subject in the pages of the last number of Michael Foster's *Archives of Physiology*. He states that he entered upon the consideration of the elasticity of the arteries with the view only of determining by direct experiment the relation that exists between the intra-arterial pressure and the cubic capacity of any given portion of artery; but as he continued to work at the subject new points arose, the examination and discussion of which have led to the publication of the present memoir. In the first place, he finds, with Wertheim, that whilst inorganic substances, such as metal wires or glass rod, extend in proportion to the weighting—at all events within certain limits,—in the case of moist animal tissues the increments in length produced by the addition of successively increasing weights diminish gradually in proportion to the weights employed. Dr. Roy next proceeded to investigate whether the thermo-elastic properties of animal tissues were identical with those of inorganic substances. Now, with one or two exceptions, all bodies on being compressed become warmer, and on being stretched cooler. But the animal

tissues agree with the exceptions to the rule—to wit, bismuth and caoutchouc—in becoming warm when stretched, whilst their temperature falls on being relaxed.

On examining by experiment the relation between the internal pressure and the cubic capacity of the arteries, Dr. ROY found that the aortic walls are most elastic at pressures corresponding more or less exactly to the normal blood-pressure, and no difference can be detected in the degree of elasticity between the time of death of the animal and the period when putrefaction has commenced. The elastic properties of the arteries taken from different animals, even of the same species, may vary considerably, and still greater differences result from malnutrition, such as that produced by febrile processes. But in a functional point of view it may be said that the elastic properties of the aorta and large arteries of any given animal are identical, so that the ratio of increase of volume to increase of pressure is the same in the aorta and its branches. Dr. ROY in subsequent sections discusses the effects of disease and of age on the elasticity of the arteries, and demonstrates by diagrams the considerable modifications that are produced by diseases affecting the general nutrition, and the fact that the elasticity is perfect only in childhood. The whole paper is a valuable contribution to our knowledge of this subject.—*Lancet*, Feb. 19, 1881.

On Elongation of the Sciatic Nerve.

In a communication to the Société de Biologie (*Gaz. Méd.*, February 5), Prof. BROWN-SÉQUARD furnishes an account of some experiments which he has made on the influence that elongation of the sciatic nerve exerts on the sensibility of limbs rendered anæsthetic by lateral hemisection of the spinal cord. Guinea-pigs, rabbits, and a dog were employed, and in almost all of them the anæsthesia disappeared, and was even replaced by more or less hyperæsthesia of the limb which had lost its sensibility. In the dog very remarkable effects were produced. The transverse section of the right lateral half of the cord, opposite the tenth dorsal vertebra, had produced paralysis and hyperæsthesia of the right posterior limb, and a very considerable degree of anæsthesia of the left posterior limb. Almost immediately after the elongation of the left sciatic nerve to at least a centimetre and a half (which was scarcely felt), sensibility reappeared in the left paw, increased rapidly, and in less than half an hour this paw became much more sensible than the fore-paws, in which the sensibility was normal. The hyperæsthesia gradually increased, and the next day it was very considerable, and almost equalled the degree of hyperæsthesia of the right limb, which had nevertheless increased. At the same time there was a very notable degree of paralysis of the left hinder limb—that of which the sciatic nerve had been elongated. The same experiment was tried in eleven guinea-pigs, and in nine of them there was a more or less rapid return of sensibility in the anæsthetic limb; and in almost all of the animals hyperæsthesia appeared in the limb that had been anæsthetic. Two of the eleven guinea-pigs did not recover the sensibility which they had lost. Voluntary motion was very notably diminished in all these animals, being almost completely lost in three of them, two of these having also exhibited very considerable hyperæsthesia. Of three rabbits upon which the same experiment was performed, in one only did a considerable return of sensibility take place. All of them had paralysis of the limb, the nerve of which had been elongated. The results of these experiments are as follows: 1. An almost immediate or more or less rapid return of sensibility in a limb in which the hemisection of the cord had caused anæsthesia—the anæsthesia being replaced by hyperæsthesia in a good number of the animals. 2. In almost all the animals

submitted to hemisection of the dorsal cord, the hyperæsthesia caused by this lesion in the posterior limb of the corresponding side is increased after the elongation of the sciatic of the other limb. 3. In all the animals there was a more or less marked and persistent paralysis of the posterior limb in which the elongation took place, and there was also an elevation of temperature in that limb. 4. Not only do the parts supplied by the sciatic recover their sensibility after its elongation, but the same change is observed in parts not animated by it.

Prof. Brown-Séquard also divided the right lateral half of the cord opposite the third cervical vertebra in a guinea-pig. After having verified the existence of hyperæsthesia in the right limbs, and very marked anæsthesia in the left ones, he elongated the left sciatic. Shortly afterwards, not only the leg, but the arm of the left side became hyperæsthetic. The irritation of the sciatic, therefore, changed the properties of the cord throughout its length. In several guinea-pigs, also, in which the cord remained intact, the elongation was followed by hyperæsthesia and paralysis, but in a far less degree than when the cord had been first divided.—*Med. Times and Gazette*, Feb. 26, 1881.

MATERIA MEDICA AND THERAPEUTICS.

On the Action of Chloroform, Ether, and Ethidene.

The Scientific Grants Committee of the British Medical Association have made an elaborate study of the action of these anæsthetics (*British Med. Journal*, Dec. 18, 1880), and offer the following conclusions:—

A. *Clinical*.—1. The dose (administered on a towel) is greater with ethidene than chloroform; but the time necessary to anæsthetize the patient is longer with the latter than the former agent.

2. The number of cases of sickness and vomiting is about the same with the two agents, but the duration is considerably protracted in the case of chloroform; the occurrence of these symptoms have no relation to the length of time the patient has been under, or reference to the quantity of anæsthetic administered in a given time.

3. With both agents, the pulse-respiration ratio is considerably altered in a certain number of cases, the pulse falling as the respirations increase in frequency. With chloroform, this change is not only much more marked, but its occurrence is also more frequent than with ethidene; the proportion, in our experience, being nine of the former to two of the latter. There is also a greater tendency in cases of chloroform to retardation of the heart's movements, and to dirotism.

B. *Physiological*.—1. The effect of anæsthesia with chloroform is to increase the amount of carbonic acid exhaled in a given time. The results of our investigations, in connection with the effects of anæsthetics on the gases of the blood, are not sufficiently reliable to permit us to give results.

2. Both chloroform and ethidene, administered to animals, have a decided effect in reducing the blood-pressure; while ether has no appreciable effect of this kind.

3. Chloroform reduces the pressure much more rapidly, and to a greater extent, than ethidene.

4. Chloroform has sometimes an unexpected and apparently capricious effect on the heart's action, the pressure being reduced with great rapidity almost to *nil*, while the pulsations are greatly retarded, or even stopped. The occurrence of these sudden and unlooked-for effects on the heart's action seems to be a source of serious danger to life—all the more that, in two instances, they occurred more

than a minute after chloroform had ceased to be administered, and after the recovery of the blood-pressure.

5. Ethidene reduces the blood-pressure by regular gradations, and not, so far as observed, by these sudden and unexpected depressions.

6. Chloroform may cause death in dogs either by primarily paralyzing the heart or the respiration. The variations in this respect seem to depend to some extent on individual peculiarities of the animals; in some the cardiac centres are more readily affected, in others the respiratory. But peculiarities in the condition of the same animal very probably have some effect in determining the vulnerability of these two centres respectively; and they may both fail simultaneously.

7. In most cases, respiration stops before the heart's action; but there was one instance in which respiration continued while the heart had stopped, and only failed a considerable number of seconds after the heart had resumed.

8. The use of artificial respiration was very effective in restoring animals in danger of dying from the influence of chloroform. In one instance, its prolonged use produced recovery even when the heart had ceased beating for a considerable time.

9. Under the use of ethidene, there was on no single occasion an absolute cessation either of the heart's action or of respiration, although they were sometimes very much reduced. It can, therefore, be said that, though not free from danger on the side of the heart and respiration, this agent is in a very high degree safer than chloroform.

10. In regard to the effect of anæsthetics upon the pulmonary circulation, as in the experiments on the effects of the anæsthetics upon the blood-pressure, it may be stated that chloroform produces the most immediate effect, ether the least, whilst ethidene occupies an intermediate position.

11. The quantity of air, and the length of time required to restore the circulation in the lung, are in an inverse ratio to the amount of anæsthetic vapour, and time necessary to stop it.

12. The changes produced in the lung are the same in all; the only difference being in the rapidity of their occurrence.

13. The anæsthetics produce the following changes in the lungs—(1) retardation and ultimate stoppage of the circulation in the lung: first in the capillaries, then in the arterioles, and subsequently in the larger vessels; (2) the epithelium-cells of the meshes and their nuclei are no longer apparent; (3) the capillaries contract slightly, and their walls become less distinct, or even disappear from view, and the inclosed corpuscles may become more or less disintegrated.

14. The effect of ether and ethidene upon the heart, after artificial respiration for seven and five minutes respectively, is simply to produce a retardation of the impulses—ethidene having the most marked effect. Chloroform not only produces a retardation of the pulse, but the ventricular contractions are delayed and slightly separated from the auricular, and an auricular contraction may immediately follow the ventricular. The auricular contractions frequently occur without any corresponding ventricular movements.

The conclusions to be drawn from the above observations are these:—

C. *Practical*.—1. It is not only necessary to watch the effect of the anæsthetic upon the pulse, but it is also requisite to have regard to the respiration. We must not only take into account the danger of sudden stoppage of the respiration, but must also remember that, in the event of abnormal increase of respiratory movements, it may become essential, for the safety of the patient, to temporarily discontinue the administration.

2. Owing to the tendency of chloroform and ethidene—particularly chloroform—to reduce the blood-pressure suddenly, not only during the administration of

these agents, *but also after they have been stopped for some little time* (a source of serious danger), it is necessary for the person who has charge of the administration of the drug to be on the lookout for symptoms of this occurrence, both during the time the agent is being given, and for some time after the patient has recovered from its more evident effects.

3. The danger of death, from stoppage of the respiratory functions, must be borne in mind in every case in which anæsthetics are given; but, of perhaps greater importance is the danger from interference with the proper action of the heart—particularly when it is remembered that, by artificial means, we can combat the former contingency. It might even be advisable, in certain cases, to introduce a tracheal-tube by the mouth—so as to enable us to force air into the lungs by means similar to those adopted in experiments with animals; or, in circumstances where such a procedure was impracticable, tracheotomy might be performed, with the same object in view. Artificial respiration should be continued, even though all evidence of cardiac action has ceased.

4. As regards comparative danger, the three anæsthetics may be arranged in the following order: chloroform, ethidene, ether; and the ease with which the vital functions can be restored may be conversely stated, thus: the circulation is more easily re-established when its cessation is due to ether than to ethidene; and when the result of ethidene, than when chloroform has been used. The advantages which chloroform possesses over ether—in being more agreeable to the patient and more rapid in its action, in the complete insensibility produced by it, and the absence of excitement or movements during the operation—are more than counterbalanced by its additional dangers.

5. The chief dangers are: (1) sudden stoppage of the heart; (2) reduction of the blood-pressure; (3) alteration of the pulse-respiration ratio; and (4) sudden cessation of the respiration. The danger with ether approaches from the pulmonary rather than from the cardiac side—so that, by establishing artificial respiration, we have a means of warding off death. Its disadvantages are, to a great extent, obviated by the use of ethidene; whilst the dangers of chloroform are also reduced to a minimum.

Effect of Chloral-hydrate on Certain Forms of Artificial Diabetes.

ECKHARD (*Arch. für Exper. Pathol.*, Band xii.) confirms the statement of Mering and Musculus, that the urine of chloralized animals does not contain any sugar. In order to see whether the diabetic puncture was effectual in chloralized rabbits, the author subcutaneously injected into the animals a gramme (on the average) of chloral-hydrate, and very frequently, after two or three hours, another dose of a quarter of a gramme. The narcosis after this was deep, and lasted five or six hours. The urine passed three or four hours after the puncture was collected, evaporated, and the fermentation-test was applied to the watery extract of the residue, always with a negative result. Even after severe injury of the vermiform process, diabetes was absent in chloralized rabbits, and in the majority of the experiments no noteworthy increase of the urine occurred. In two converse experiments, the author noticed the following results. After the vermiform process had been divided in the healthy rabbit, the urine showed itself strongly impregnated with sugar in the course of one hour. If the author injected subcutaneously one gramme of chloral-hydrate, the urine of the next hour still contained sugar, but not that of the second, third, and fourth hours. In a third series of experiments, the author endeavoured to decide whether the chloral-narcosis does also not prevent the diabetes caused by reflex action. For this purpose the author irritated, in rabbits, one of whose vagus nerves on the neck had

been cut, the central end of the same at intervals of from three to five minutes, each time for two minutes; in a normal animal, diabetes occurred after one hour's irritation; in chloralized animals, however, the urine did not contain any sugar, even after irritation, for several hours. In a dog, however, the urine of which was free from sugar after five grammes of chloral-hydrate, the inhalation of carbonic oxide produced distinct diabetes. In one patient with diabetes, the quantity of sugar in the urine decreased considerably after the use of chloral, whilst in another patient there was only a considerable diminution in the quantity of urine.

MEDICINE.

Pilocarpin in Diphtheria.

Dr. GEORGE GUTTMAN, of Cronstadt, writes, in the *Berl. Klin. Woch.*: Knowledge of the physiological action of pilocarpin and of its effects upon bronchial catarrh, giving rise to moist *râles*, led me to believe that, administered in diphtheria, it might loosen the diphtheritic membrane through the induced abundant salivary secretion, while it would not excite any inflammatory condition. The result of the proposed treatment was, above all expectation, brilliant and striking. In April, 1879, an entire family of seven fell sick, one after another, with diphtheria; three exhibited the severest typhoid symptoms. The second case I treated with pilocarpin in moderate doses. The next day I found a copious salivation, and fragments of pseudo-membrane floated in the expectorated matters. Pilocarpin was administered also to the other five patients. In addition, the usual general treatment was followed; quinine, tannin locally, gargles of lime-water and pepsin. The patients recovered in from two to four days. Since these first cases, down to August 1880, sixty-six cases of diphtheria (*rachenbräune*) have come under my care; fifteen exhibited the worst of the diphtheritic symptoms, of which, according to my previous experience, at least two-thirds would have certainly died; thirty-three would be termed bad cases, the membrane being extensive, the remainder were slightly affected. I gave pilocarpin to all; only in the first cases, quinine and gargles also; they recovered, as a rule, in periods of time varying from twenty-four hours to three days; of the fifteen worst cases, two recovered in nine and eleven days, the rest in two to five days. All patients who came early under treatment, while the pseudo-membrane was still loosely adherent, without exception were cured within twenty-four hours. The doubt that these cases were not truly diphtheritic is not to be raised, since they were examined with the utmost care, and in the worst cases the contagion could be distinctly traced. Under the action of the pilocarpin, not only were the membrane and infiltration dissolved in the salivary flow, but also the violent inflammatory condition yielded to its influence, the deeply reddened, dry, mucous membrane soon became moist, pale red, and in every respect of normal appearance. Led by these results, I prescribed pilocarpin in violent pharyngeal cases, angina aphthosa and tonsillaris, always with most happy results, the disease yielding in a short time. In two cases of violent tonsillitis, in which the tonsils were so swollen that water could be taken only with great difficulty, and scarification was positively indicated, not only did the swelling disappear, but the entire group of inflammatory symptoms, the one in twenty-four hours and the other in thirty-six. In the few cases of membranous croup that have fallen into my hands during the past fifteen months, pilocarpin has proved a faithful ally, and I believe it will prove as effective as in diphtheria of the fauces. Two cases of laryngitis stridula yielded promptly to the same drug, which is safer and more

convenient than the usually prescribed emetic. Others have used pilocarpin under my advice, and agree with me in maintaining its excellence in diseases of the nature described. In the administration of this remedy I combine pepsin to combat the gastric catarrh usually present. My formula is as follows: *R* Pilocarpini muriat. gr. $\frac{1}{2}$ – $\frac{2}{3}$; pepsinæ, gr. j– $1\frac{1}{4}$; acidi hydrochlor. gtt. ij; aquæ dest. $\mathfrak{z}$ iiiss. M. Sig. A teaspoonful hourly for children. For adults—Pilocarpini muriat. gr. ss–j; pepsinæ, gr. xxx; acidi hydrochlor. gtt. iiij; aquæ dest. $\mathfrak{z}$ viiij. S. Hourly, a tablespoonful. I have never observed any undesirable effects of the drug even when it has been continued until complete recovery, possibly because I give a small amount of generous wine after each dose.—*London Med. Record*, Feb. 15, 1881.

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The Constitutional Symptoms which occur during the Prodromal Period of Syphilis.

The following is a *résumé* of M. MAURIAC's views on this subject, as set forth in a lecture published in Nos. 31, 32, and 34 of the *Lyon Médical*, 1880. There is never any constitutional disturbance before the appearance of the chancre. The interval between the chancre and the manifestation of constitutional disturbance ought to be called secondary, or constitutional, or syphilitic incubation, to distinguish it from the period of incubation which intervenes between contagion and the appearance of the initial lesion. The duration of this secondary incubation varies considerably. In a large number of cases where the disease was left to itself, the author found that it ranged between forty-five and sixty days. The appearance of general symptoms may be influenced in various ways. 1. *Specifics*.—The influence of these has been exaggerated. Often, in spite of mercury having been given from the first appearance of the chancre, the period of incubation is not delayed. 2. *Season*.—The stages of syphilis are shorter, and succeed each other more quickly in hot than in cold climates; but in our own climate the variations of temperature are too feeble to exercise much influence in this respect, except in unusually severe seasons. 3. *Intercurrent Maladies*.—Fevers and inflammations are those which most manifestly prolong the incubation of syphilis.

The following are the prodromata of secondary syphilis: *a*, syphilitic fever; *b*, pain of various kinds, *i. e.*, nocturnal headache, neuralgia, muscular pains, osteocopic pains, arthralgia, pleurodynia, lumbago, etc.; *c*, encephalic troubles; *d*, cardio-pulmonary disturbances; *e*, disturbance of nutrition, with or without asthenia of the functions of the sympathetic nervous system. All these prodromata occur much more frequently in women than in men. In most men, syphilis produces its first effects without disturbing the general health. In women, slight headache, malaise, and sweating are the most usual prodromata. The constitutional troubles generally cease when the exanthem appears, but sometimes they persist during the secondary stage, and may even cause a state of cachexia. In most cases the prodromal symptoms have no special gravity, and disappear spontaneously, or under specific treatment. They are of no value as regards prognosis; sometimes a mild course of syphilis is preceded by severe general disturbance, while a grave or even malignant form of the disease may occur when there has been no marked physical or functional disturbance at the outset.

Syphilitic Fever.—The frequency of this has probably been exaggerated. In most patients it is exceptional or very slight. It is infinitely more common in women than in men. Syphilitic fever never occurs during the first week of the chancre, but only when the general intoxication reveals itself; this is usually about eight to fifteen days before the appearance of the rash. The fever is generally intermittent, rarely continued. The attacks occur at irregular intervals, and are

often incomplete. Sometimes the fever comes on abruptly; sometimes it is preceded for a few days by general malaise, headache, etc. The *intermittent form* consists of a series of fits, which come on almost always towards evening, and in this respect resemble hectic much more than ague. Each fit lasts eight or ten hours, is followed by a period of complete apyrexia, and the attack does not return with the almost mathematical regularity of malarial ague; very frequently one stage may be absent. Violent shivering is very rare; much more usually there are repeated slight shivering fits, which precede the fever by some hours. The hot stage is much more constant than the cold stage. The sweating stage is very rarely absent; indeed, in some cases it is so prominent a feature that it seems to constitute the whole fit, and may last all the night. Intermittent syphilitic fever is nearly always quotidian, but the author has seen the tertian variety, and gives a case of this form. One most remarkable character of syphilitic fever is its slight influence on the general health. The tongue often remains clean and moist, and the appetite unimpaired. M. Mauriac has never observed boulimia or polydipsia in men. The spleen is not usually affected, but if it be slightly enlarged, never to the extent observed in malarial fever. The *remittent form* of syphilitic fever is less common than the preceding, but, like it, lasts a week or a fortnight. The fever never completely ceases. The exacerbations have no regularity; they occur sometimes in the morning, sometimes in the evening; and are generally more incomplete and irregular in their stages than the intermittent form. The remission is always longer than the attack. This form is more serious than the intermittent, and affects the general functions more severely. There are nearly always violent headache, general malaise, etc., and sometimes insomnia and asthenia, of a typhoid character. The digestion, however, is often normal. A third form of syphilitic fever has been described by some authors, but it is really only a mixture of the two preceding forms.—*London Med. Record*, February 15, 1881.

Pilocarpine in Bromidrosis.

M. ARMANIGAUD, associate professor of the Faculty of Medicine in Bordeaux, read a paper on the employment of hypodermic injections of nitrate of pilocarpine in cases of fetid perspiration of the feet. The following are his conclusions:—

“Certainly the preceding facts are not sufficiently numerous for us to affirm that we have in pilocarpine a sure and certain means of curing fetid perspiration of the feet. I will even add that I have observed in regard to pilocarpine when employed in intermittent fever such contradictory results that I have been brought to distrust a little the therapeutic action of pilocarpine (even when a perfectly identical result is in question). I believe however that I may draw the following conclusions from the preceding facts, which if they were not definitive, will be able to serve at least for the basis of new researches.

“1. Repeated hypodermic injections of nitrate of pilocarpine appear to have a curative action in fetid perspiration of the feet.

“2. Suppression of perspiration of the feet obtained by the use of this substance, even when it has taken place suddenly, does not appear to have any disastrous effect on the organization.

“3. Is this action definitive or simply temporary? This will be proved by the continued supervision of my three patients, and whatever may be the result I shall hasten to make it known.

“4. In this case pilocarpine acts by producing a derivative and substitutive hypersecretion in the salivary glands, and the sudorific action, which is obtained more surely and more completely with jaborandi than with pilocarpine, does not

seem capable of being substituted advantageously in this sialagogue action of pilocarpine.

"It would be interesting to ascertain whether the result which gives rise, probably by its decomposition, to the fetidity of morbid perspiration of the feet, no longer set free by the palmar and lateral surface of the toes, and of the sole of the feet, would not be eliminated by the salivation thus produced. But we, first of all, must know with certainty the cause which gives rise to this repulsive odour, and we are far from being decided on this point.

"However, we ought to value highly the opinion of M. Charles Robin, who, having proved that this morbid sweat contains leucine, attributes the fetidity to the decomposition of this substance, and to the formation of valeriate of ammonia. I purpose, therefore, in the new observations that I shall make on this subject, to collect saliva and to investigate the presence of leucine."—*L'Union Médicale*, Jan. 27, 1881.

Treatment of Cerebral Hemorrhage by Subcutaneous Injections of Ergotine.

Dr. FOSTER, encouraged by numerous successes obtained in the treatment of hemorrhages in general by injections of ergotine, conceived the idea of trying this method in cases of cerebral apoplexy. He employed it in the cases of three patients whose diagnosis admitted of no doubt, and who could not reap any benefit from internal medication as deglutition was impossible.

Dr. Foster saw the first of these patients about an hour after the onset of the symptoms. One injection of ergotine was sufficient to dissipate the coma, whereas the methods employed previously had had no result. On the other hand, having been called to the second patient immediately after the attack, he was able to prove that the injection of ergotine sensibly weakened the intensity of the coma. Ergotine, as we know, arrests hemorrhages by promoting the contraction of the arterioles; it is therefore reasonable to employ it when the hemorrhagic effusion is produced in the midst of the cerebral substance. But, in order that the action of the drug may prove efficacious, the attack should be a recent one.—*Bulletin Gén. de Thérapeutique*, Nov. 30, 1880, from *Journal Medico-Chirurgical de Pesth*, No. 8, 1879.

Nitrite of Amyl in Epilepsy.

Dr. MARAGLIANO (*Note di Clinica Medica*, Genoa, 1880) determined to try whether nitrite of amyl would so modify the cerebral circulation as to have a permanent effect in diminishing the fits of epilepsy. In inhaling the medicine, he used a bag of caoutchouc containing some cotton-wool, which was applied to the nostrils while the patient was allowed to inspire air through the mouth. The dose given was much higher than that used by other physicians. Beginning at 10 drops, he gradually mounted to 40, and he continued the inhalation as long as fifteen minutes without any instances in which harm was observed. Where the epileptic attacks were numerous, the inhalations were repeated once every hour. Dr. Maragliano quotes the experiments of Schüler, who found that, in rabbits in which an opening had been made in the skull, from five to three inhalations caused a dilatation of the venous and arterial vessels of the pia mater. The smaller arteries began to pulsate, and some of them to assume serpentine curves. The brain expanded and bulged out of the trepanned hole. He notices the denial of Vulpian that nitrite of amyl has any congestive action on the brain, but finds from his own observation that the temperature of the head is increased by the action of this drug. In like manner he rejects the negative observations of Loemisch, Stammeshaus, and Pick for those of Aldridge, Tebaldi, and Grade-

nigo, who hold that the vessels of the retina are dilated after the use of inhalations of amyl. Ladendorf found that the temperature of the mouth was raised by half a degree C. during an inhalation. That this drug impedes the oxidation of the blood is universally admitted. He found that, out of thirty cases after inhalation of amyl, sugar appeared in the urine in twenty-four, and was totally absent in six. All traces of the sugar passed away entirely after three to six days. This appearance of sugar is supposed to be owing to the dilatation of the hepatic vessels. He admits that there are cases in which amyl is of no use in epilepsy, it promises most in those patients in whom the face becomes pale. Dr. Maragliano considers that the power this drug has in dilating the vessels of the brain (*la sua azione iperemizzante sul cervello*) is the cause of its therapeutic value in epilepsy.

Dr. Maragliano has made some very careful observations to ascertain the direct effect of the inspired nitrite of amyl upon the blood. He found that neither the size of the globules nor their number was affected by this drug.

The author sums up as follows:—

1. That the inhalation of nitrite of amyl methodically and persistently, and not with the view of cutting short impending attacks, causes a notable diminution of the violence and number of the epileptic seizures. This is proved by the three observations described, as well as several others in which the results were identical. The method employed by us is different from what is habitually followed, which was to cause the amyl to be inhaled after the beginning of the attack or after the aura came on in order to avert the fits. Hammond has tried the drug in much the same manner as ourselves without being able to report any benefit; but we using larger doses have obtained favourable results from the use of amyl. Some other observers have also reaped benefit, among them is Crichton-Browne, who however did not use the drug in the same fashion. He succeeded in eight cases out of ten in cutting short the status epilepticus in which fits succeeded one another without intermission, the patients remaining unconscious during the intervals.

2. That the dose of the nitrite of amyl may be raised without inconvenience to forty drops—the inhalations being prolonged for forty minutes and repeated from four to six times a day.

3. That the cerebral temperature is gradually raised from .3 to .8 of a degree C. during inhalation of the nitrite, on the cessation of which it again descends to the usual grade.

4. That the inhalation of nitrite of amyl in most instances causes the appearance of sugar in the urine amounting to from 1 to 2½ grammes in the twenty-four hours.—*Brain*, Jan. 1881.

— *Nerve-extension in Locomotor Ataxy.*

In the *Progrès Médical*, 1880, No. 50, Dr. BLONDEAU gives the following account of the recent successful performance of this operation:—

“At the end of one of his clinical conferences, Prof. Chareot presented a patient who excited the highest interest. This patient, from the service of Dr. Debove, of Bicêtre, is the subject of locomotor ataxy, upon whom the elongation of the left sciatic nerve has been practised with the view of relieving him of the incessant and atrocious shooting (*fulgurants*) pains from which he has long suffered. He is also the first patient upon whom this operation has been attempted in France.

“The elongation of the nerves in the subjects of ataxy is an operation of quite a recent date, and it is in Germany that it took its origin. The surgeons of that country, who for some years past have already treated various forms of neuralgia

by elongation, and reckon a certain amount of success from the procedure, have probably been led to employ it in ataxy under the idea that the shooting pains may be regarded as a neuralgia arising from organic spinal lesion. However this may be, they have had recourse to this operation in three cases of ataxy, and have obtained either a cure or a notable amelioration. In the first case, due to Langenbeck, the two sciatic nerves were elongated, and then the two femoral, with the results of a disappearance of the pains and a cessation of motor incoördination. In the second case—that of Esmarch—the results were yet more brilliant; for, as a consequence of the elongation of the nerves in the axilla for the relief of the pains in the forearm, the motor incoördination entirely disappeared. In the third case (Erlenmeyer's) the result was not so satisfactory. The two sciatic nerves were successively elongated; but there followed only some slight increase in the strength of the patient, no change occurring in the disturbed sensibility or the motor incoördination.

“The results of these cases induced M. Debove to make a trial of the same means in a case in his service. The subject operated upon was an ataxic who had reached a very advanced stage of the disease, and who had kept the bed for eighteen months. The symptoms which he presented were as follows: violent shooting pains of an exceptional intensity, occupying the upper as well as the lower limbs, and preventing sleep. He never passed twenty-four hours without these pains manifesting themselves, injections of morphia having been employed for their relief until the dose of sixteen centigrammes was reached. Gastric, urethral, and vesical crises occurred about every eight days; and there was motor incoördination, which was limited to the lower extremities, the patient being quite unable to maintain himself erect, and sinking down upon himself when the attempt was made to make him walk by supporting him under the arms. There was an absence of tendon reflex on both sides. Very marked myosis of the two pupils existed, but was unoccupied by any disturbance of vision. Cutaneous sensibility was diminished, but there were no patches of anæsthesia. The notion of the position of the lower extremities was lost. Dr. Gillette, on November 18, laid bare the left (chosen because the pains were most violent on that side) sciatic nerve at the middle of the posterior part of the thigh, and seizing it with his fingers, elongated it twice suddenly and violently. Antiseptic dressing was then applied. Chloroform was not employed, because physiological experiments have shown that when a nerve is violently pinched there is a momentary arrest of the respiration and circulation; and it was feared that any such arrest might prove dangerous to a subject under chloroform. In spite of this, the operation was not very painful, which may be attributed to the influence of the morphia with which the patient was saturated. He himself declared that he did not suffer a hundredth part of what he suffered during his crises. The results obtained are most remarkable. The shooting pains have quite ceased, and the muscular incoördination has almost disappeared, the tendon reflex, however, is still absent, and the pupillary myosis continues. These results, Prof. Chareot, as is his custom, rendered visible and palpable to his auditors. The patient was brought in on a litter, and, as requested, raised one or other of his limbs alternately. Prof. Chareot having placed his hand about sixty centimetres above the patient, the latter, almost without hesitation, touched it several times with the point of his foot. Two assistants supported the patient in the erect posture, and he was able to maintain this without oscillating, and even to make a few steps.

“What has been the mode of action under these circumstances? Has the spinal centre or the nervous system been acted upon? At present this is not known, and, as Prof. Chareot observes, it is of little consequence. What we should realize is the fact that elongation—if the results thus far obtained are

confirmed—is an operation destined to render the unfortunate subjects of ataxy invaluable services. But we should guard ourselves against unreflecting enthusiasm, and not, basing our procedures on these successful cases, perform elongation in all examples of the disease. This would be to carry our aim too far, and it is necessary that we should act with prudence and scientifically, operating only when real indications are present.”

Reporting on this case at a later period (*Progrès Méd.*, No. 52), and referring to another case also occurring in Dr. Debove's practice, Dr. D'Olier says:—

“We have seen this week at Bicêtre the patient whom Prof. Chareot exhibited to his class at Salpêtrière. This man, who for years past had suffered horrible pains in his lower extremities, scarcely attenuated by large doses of morphia, has not felt since the elongation—that is, for about a month—the slightest shooting pains either in the lower or upper extremities, and the gastric disturbances from which he suffered have entirely disappeared. Moreover, the motor incoördination has almost entirely disappeared on both sides.

“On December 16, Dr. Debove, in accord with Dr. Gillette, made another trial upon a subject of ataxy, who, encouraged by the cure of his comrade in misery, demanded an operation for himself, he being the victim of incessant shooting pains, with exacerbation, and affecting both upper extremities. Dr. Gillette having laid bare the right radial and median nerves, passed a sound beneath them with its convex side towards the nerves. Then the instrument being held by its two ends, tractions were made perpendicularly to the axis of the nerve with sufficient force to raise the latter five or six centimetres. With respect to these tractions it may be observed that there is no fear of rupturing the nerve during their employment. Some experiments made on the dead body have shown that a force of forty-two kilograms is necessary to rupture the radial, the tractions made on the living subject being far below this figure. In this patient, as in the other, the shooting pains have considerably diminished in the right upper extremity, and have disappeared in the left extremity and in the lower limbs. The plantar anæsthesia has much diminished on the left side, and motor coördination has been much improved. Walking without support has become possible. The patient has recovered regular sleep, and refuses the aid of morphia, declaring that his pains are nothing to those which he endured before.

“The result of these two operations is sufficiently remarkable to be carefully noted. If the procedure is only a palliative, which, according to all probability, does not arrest the progress of the ataxy, these two examples prove at least its efficacy against two of the important symptoms of the disease—pain and disturbances in motor power, and perhaps also those of sensibility.”—*Med. Times and Gazette*, Jan. 22, 1881.

Langenbuch and Esmarch have described two cases of tabes treated by nerve-stretching. The idea was to relieve the patients of their acute pains; and not only did the result justify the keenest hopes entertained on that score, but, to the astonishment of all concerned, the ataxy itself was greatly reduced by the operation. ERLÉNMEYER discusses these cases and their various bearings, and contributes another instance of nerve-stretching in an advanced case of tabes. The patient had passed through the period of shooting-pains, and had entered upon the third, or paralytical, stage of the disease. The ataxia was excessive, the muscular sense absolutely lost, the bladder paralyzed. The most energetic treatment, including anti-syphilitic courses, had failed to effect any improvement. On June 22, 1880, the right sciatic nerve was exposed by means of an incision over the sciatic notches (Erlenmeyer considers it advisable to operate as near the centres as possible). Lister's method was followed, and the wound healed by first intention. On July 3, the left sciatic was stretched. At this time the right

leg had distinctly gained in strength, but the ataxy was not notably diminished. The healing of the wound on the left side gave some trouble, on account of some erysipelatous complications. On the 16th of August, the patient could stand alone against a wall, which was previously impossible, and may be considered as a proof of a gain of strength. The ataxy remains much the same; but the remnants of the shooting-pains, which atmospheric vicissitudes always aroused, have disappeared.

The comparative failure in his case is attributed by Dr. Erlenmeyer to the insufficient force exerted in stretching the nerves. But this method of treatment in locomotor ataxy, especially at an early stage, ought to be put to the test in a systematic manner. If possible the amount of traction necessary to produce the beneficial effects should be determined objectively by means of weights, or some other means of measurement.—*Brain*, Jan. 1881, from *Centralblatt für Nerven-heilkunde*, No. 21, 1880.

On Tendon-Reflex.

An interesting paper has been written by Dr. H. SENATOR on the physiological relations of the phenomenon known as tendon-reflex. A sharp blow on the tendon of the patella, when the legs are crossed, will cause the leg to be raised by the sudden contraction of the quadriceps extensor femoris, and a movement of the feet can be induced by a similar blow applied to the tendo Achillis. Tschirjew has shown that in the rabbit the centre for the reflex act in the patellar-reflex is situated between the fifth and sixth lumbar vertebræ, the afferent fibres proceeding from the tendon, and not, as Joffroy maintained, from the skin. These fibres run in the crural nerve, the division of which puts an end to the phenomenon. Senator corroborates Tschirjew's statement that division of the spinal cord opposite the fifth or sixth lumbar vertebra abolishes patellar tendon-reflex. He finds, further, that division of one lateral half of the spinal cord at this level abolishes the reflex on the corresponding side only. There is, therefore, no decussation of the nerve fibres. Division of the lateral column on one side produces the same effect. Division of the posterior cornua of the gray substance does not abolish the tendon-reflex. He concludes that in this part of the lumbar region both the sensory and motor fibres of the posterior extremities are exclusively contained in the lateral columns of the cord. It is remarkable that the patellar tendon-reflex can only be induced by one kind of stimulation—namely, mechanical shock or sudden extension by a blow. Neither electric, chemical, nor thermic stimuli have any effect. Nor has such stimulation as can be applied by pricking, cutting, or pressure. Senator discusses the views of Tschirjew in regard to its presence in health and disease, and appears to think that it is not always demonstrable in health, and not always absent in ataxy.—*Lancet*, Feb. 12, 1881.

Suppuration of an Enlarged Thyroid.

Spontaneous suppuration of a goitre is one of the least common terminations. An instance in which this occurred during the course of an attack of typhoid fever has lately been recorded by M. WEILL, from Jaccoud's wards. The patient was a man, aged twenty-two, who had a goitre of moderate size and firm consistence. He had lived until within four months in a district where goitre is endemic. The attack of typhoid fever ran a normal and mild course. The day after the temperature had become natural, he complained of severe pain in the neck, and the surface of the goitre was observed to be reddened. During the next day the redness and size of the goitre increased, and its consistence diminished, until distinct fluctuation was perceptible. A week later it was incised, and a large quantity

of pus escaped. A drainage-tube was applied, and the cavity washed out daily with carbolic acid. It gradually lessened in size, and was ultimately reduced to two or three small nodules by the side of the larynx.—*Lancet*, Jan. 29, 1881.

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Treatment of Exophthalmic Goitre by Subcutaneous Injections of Duboisia.

M. E. DESNOS, in an interesting paper on this subject (*Bulletin Gén. de Thérapeutique*, Jan. 30, 1881), concludes that the neutral sulphate of duboisia, administered in subcutaneous injections of one milligramme ($\frac{1}{10}$ grain) or a half milligramme to the dose, according to the tolerance of the patient, can produce good effects in cases of exophthalmic goitre; its employment is harmless, and accidents may be easily arrested by diminishing the injected dose. Whatever may be the duration of the disease, the improvement is the same; but we must be prepared for the fact that, if in the beginning all the symptoms improve, this improvement may not always continue. The medication, if persisted in longer, might be able perhaps to give better results; which can be ascertained only by observations pursued still further.

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Pneumothorax.

In the *Berl. Klin. Wochenschrift*, No. 52, 1880, is a short account of an address by Dr. SENATOR, giving the results of his experience as to the course and treatment of pneumothorax. 1. The pleural exudation appearing in pneumothorax is, he finds, more frequently serous than is generally supposed. 2. Frequently in unilateral pneumothorax double pleurisy appears. 3. If the pneumothorax, as is generally the case, is caused by pulmonary disease, the resulting exudation suffers decomposition extremely seldom, provided naturally that the diseased lung had not already gone on to decomposition, as, for example, in gangrene. The cause of this rare occurrence of decomposition seems to be the cellular spongy construction of the lung enabling it to act as a filter; also, the large amount of carbonic acid in the air of the lung. 4. That the air entering the pleura from the lung is comparatively harmless, more especially when compared with the air entering through a wound of the thoracic wall, is shown by the occurrence, even if rare, of cases where no exudation follows a rupture of the lung. 5. That pneumothorax may take place through decomposition of an exudation in a closed pleura, Dr. Senator considers not at all impossible. 6. As to treatment, Dr. Senator considers puncture of the air quite a useless, if a harmless, procedure, and recommends at first the use of injections of morphia. Later, if exudation have taken place, the absorption of the air should be awaited. When this has happened, or should there be pressing necessity, puncture, and should this show decomposition, make an incision at once. Should it show a serous exudation, aspirate cautiously. He would puncture and aspirate in cases of pus in the pleura with a diseased lung. Professor von Langenbeck, in the discussion on Dr. Senator's address, stated that in his experience the exudation from shot-wounds and crushing of the thorax (hæmopneumothorax) as a rule decomposed, and that very quickly. That a pneumothorax might occur from the decomposition of an exudation in a closed pleura he could quite believe, from cases of hydrocele and inflammation of the knee-joint, where gas had formed, under his own observation.—*London Med. Record*, Feb. 15, 1881.

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The Treatment of Empyema.

Professor KÖNIG, of Göttingen, who is one of the editors of the *Centralblatt für Chirurgie*, contributes to No. 48, 1880, of this periodical, an article "On the Treatment of Empyema," which, though composed in the somewhat dogmatic

style that is characteristic of the writings of many Germans, is not by any means devoid of interest. He claims to speak with an authority derived from a large experience, and he lays down the law very definitely in comparing repeated puncture with free incision: "It must, on the one hand, be declared inadmissible," says he, "for any one, after the evacuation of a putrid effusion, to proceed further in attempting disinfection through the puncture made by the trocar; and, on the other hand, we hold that repeated puncture always involves a risk to the life and health of the patient, even although we allow that here and there a case may recover as the result of such a line of treatment. *Das heisst nach unserer Auffassung Hazard gespielt.*" He considers the following as two absolute indications: 1. Putrefaction of the contents of the pleura makes a free incision imperative. 2. If the contents of the pleura be unmistakably purulent, they should also be evacuated by means of free incision and drainage. The following sentence we transcribe in full: "When I first entered upon the discussion of the treatment of empyema by incision, I had at my disposal only a scanty supply of statistics bearing upon the results of the operation. It is not so now; the observation of a large number of patients enables me to point to the incision of pleural abscesses as one of the most blessed results of Lister's method of treatment. For, in the hands of any one who has mastered only in some degree the principles of antiseptic surgery, this way of dealing with a simple empyema is absolutely certain to lead quickly to a successful result. The temperature falls immediately on the evacuation of the pus, the patient recovers his appetite and his weight begins to increase, and after the period of from three to six weeks which elapse before the opening has healed he is completely cured, his lung having regained its function, no permanent deformity of the chest in most cases remaining. Of course this does not apply to old fistulous cases, in which the lung is displaced and degenerate; but even in these the antiseptic treatment, though no doubt difficult of application, is of enormous benefit. But this procedure in a case of simple empyema is not only absolutely certain; it is, in our opinion, absolutely free from danger. And, moreover, the one danger which formerly we were obliged to allow as being present, has now quite disappeared, since we recognize the fact that to wash out the pleura with a solution of carbolic acid is absolutely unnecessary. Since the occasion when a child, the patient of a friend and colleague of ours, died of acute poisoning after the pleura had been washed out with a solution of carbolic acid, we have constantly endeavoured to banish this procedure from our practice; and we are quite in agreement with Guschel, who says that most cases of empyema do not, as a rule, require it. But if it become necessary, or if it be necessary at the time of the operation, because the pus is really putrid or suspected of being so, a solution of chloride of zinc (one to thirty, or one to fifteen), which is absolutely innocuous, should be employed." This may perhaps strike the reader as possibly painted somewhat *couleur de rose*: one would like to see a little more definite statement as to the cases Professor König has treated, and of the actual proportion who recover completely in from three to six weeks. The assertion with regard to such strong solutions of chloride of zinc is also rather startling. Still, we are able to bear out in great measure the truth of what he says. We cannot agree that any method of treating an empyema is absolutely free from danger. We saw not long ago a patient almost asphyxiated after the incision in the chest had been made—partly as a result of the secretion of mucus from the bronchial tubes, owing to the administration of ether; partly owing to the fact that the opening of the pleura rendered the lung on the affected side completely *hors de combat*; and partly because a small amount of pus was coughed up at the time. We only mention this in order to show that the generalizations of Professor König

are perhaps a little too comprehensive. It will be interesting to English surgeons to know that Professor König adopts as a routine practice the plan of cutting out a piece of the rib; he makes his first incision on to the rib, separates the periosteum, and removes a portion half to three-quarters of an inch long, the object being to avoid the nipping of the drainage-tube, which is often so troublesome. He has abandoned the plan of making the opening in one of the lower spaces behind, choosing now generally the fifth or sixth rib near the latissimus dorsi (we suppose, the border of the muscle). He only makes the double opening in those cases where thorough and repeated washing out of the cavity is necessary. It is also interesting to see that while he makes his drainage-tube as thick as the finger, he does not use one longer than the little finger; the extensive coils of tubing which we have often seen coaxed, at the expense of considerable trouble, into the pleural cavity have, it must be confessed, always seemed not only useless, but absolutely pernicious.—*Med. Times and Gazette*, Jan. 29, 1881.

Pulmonary Syphilis.

In a recent article on syphilis of the lung (*Giornale Italiano delle Mal. Ven. e della Pelle*, August, 1880), Professor GAMBERINI relates the following cases which came under his observation, and which he considered to be instances of early syphilitic disease of the lung. Case 1.—A man, aged 32, of healthy antecedents, contracted a hard sore on the prepuce, which was followed by papular angina. The symptoms yielded to mercury. Four months afterwards, difficulty of breathing came on, and soon became so severe that he returned to Gamberini's clinic for relief. On examination, the left side of the chest moved less freely than the right. There was also a localized patch of dulness between the third and fifth ribs on the left side of the chest, with deficient respiratory murmur. The remainder of the chest was normal. There was enlargement of the inguinal, axillary, and cervical glands. Dyspnœa and general malaise were complained of, but there was little or no cough, nor expectoration, and no fever. Under the administration of iodide of sodium gradually increased to 3 grammes (45 grains) daily, all signs of the lung affection disappeared in forty days. Case 2.—A man, aged 27, of previous good health, and with no family history of tubercle, came under treatment for pain at the lower part of the chest, cough and expectoration, with fever. He had at the same time an indurated cicatrix on the frænum, and multiple glands in the groins. A few days afterwards, a lenticular syphilide and erythema of the fauces appeared. The chest was well formed, but the right side moved less freely than the left during respiration. In front, percussion showed no difference between the two sides, but behind, on the right side, there was diminished local resonance in the supra-spinous and infra-scapular regions, with deficiency of the respiratory murmur in those situations. In front, on the right side, inspiration was interrupted, and weaker than on the left, and coarse crepitating râles could be heard. The spleen was slightly enlarged. The other viscera were normal. Mercury was given by the mouth, and also by subcutaneous injection, for about three weeks, and subsequently iodide of sodium. The patient recovered in a month. The temperature in this case never exceeded 101.4° Fahr. The expectoration was at first yellowish-white, then became rusty and tenacious; subsequently it was mucous in character, and finally ceased altogether.

The author concludes his paper with some propositions, of which the following are the chief. The existence of a simple inflammatory syphilitic pneumonia is admissible, but is not yet proved. There can be no doubt about the

existence of gummy disease of the lung, for which the author proposes the name of "consumptive pulmonary syphilis." Specific treatment is the best therapeutic means at present known for distinguishing syphilitic from tubercular disease of the lungs. The occurrence of pulmonary disease is not rare, either in late or early acute syphilis. Laryngeal lesions often precede or accompany the affection of the lungs, and the former may be of great value in the diagnosis of the latter. The symptoms of syphilitic disease of the lung are generally those of pneumonic phthisis. Even after death, tubercle cannot always be distinguished from gumma. Tubercle usually attacks the apex of the lung, while syphilis usually (but not always) avoids it. The course of syphilitic pulmonary disease is usually slow and apyretic. Syphilis most usually attacks only one lung, and often only one part of a lung.—*London Med. Record*, Feb. 15, 1881.

Treatment of Uræmia by Pilocarpin.

Dr. PRÆTORIUS publishes (*Jahr. für Kinder*, vol. xv. pl. 3) the details of eleven cases of uræmia treated with muriate of pilocarpin, and arrives at the following results: 1. The drug is of distinct value, and should be injected so soon as the symptoms of headache, irregular pulse, vomiting, and diminished secretion of urine appear. 2. Its administration is only contra-indicated in cases of extreme weakness and threatening collapse, or general anasæra. 3. It has no effect in cases of glomerular nephritis; but, since this condition cannot be diagnosed by the microscope, its administration should not be prevented. 4. Pilocarpin is not only a diaphoretic, but also has a direct influence on the renal secretion. An extensive series of references to the use of the drug is appended, as well as a description and method of administration, etc.—*London Med. Record*, February 15, 1881.

SURGERY.

The Benignity of Syphilis.

In an essay on this subject, to which was awarded the annual prize of the Medical Society of the county of New York, Dr. CHARLES L. DANA contends:—

First.—That syphilis, as a rule, runs a very mild course, indeed, among American seamen, and physically incapacitates them less than either soft chancre or gonorrhœa with their complications and sequelæ.

Second.—That it runs this course, often without regular treatment, and almost always in spite of irregular living and unhygienic surroundings. These two conclusions, it may be added, tend to confirm the views of those who believe

(a) that syphilis is curable, and, furthermore

(b) that it very often has a tendency to spontaneous cure;

(c) that this present benignity of the syphilitic poison is due in part to treatment, in part to a gradual change, either in the character of the poison itself, or in the organism it feeds on, or both.

The question of benignity or virulence of syphilis, as it attacks other classes than sailors, is left untouched, and the term "benign" is used only as indicating that the disease is not malignant nor fatal, nor, as a rule, severe.

Dr. Davis's study has led him to believe that philanthropic effort for the protection of seamen from venereal disease might be successfully made in the following directions:—

First.—The improvement of his "environment," of his social and sanitary surroundings when on shore; the getting him out of the clutches of boarding-

housekeepers and others who fill him with bad liquor, entice him into brothels and rob him of his money. If his social condition were bettered, his moral improvement would surely follow or go with it. Something is being done in this direction.

Second.—The regulation of prostitution. That this would benefit him to some extent there can be no doubt. But the system of regulation would have to be comprehensive and very effectually carried out. It would have to be applied to the whole municipality, and its adoption involves the general question of the regulation of prostitution, which this is not the place to discuss.

Marriage, so far as it is possible, is a help to the sailor. Of the 378 men examined, there were not 30 who were married. The sailor is a celibate. But among these 351 celibates there were 272 cases of venereal disease. On the other hand, of the 27 married seamen, 14 never had had any venereal disease, and 21 never had any during the period of their marriage. Of course, matrimony is often impracticable or unwise, but celibacy is also more frequent than it need be.

As the sailor's sanitary, social, and moral condition improves, the possibility of and desire for domestic life will increase, and will do its share to improve his physical condition.—*Med. Record*, Feb. 5, 1881.

Syphilitic Myositis.

M. DUPLAY reports (*Archives Gén. de Méd.*, August, 1880, p. 218) two cases of syphilitic disease of the muscles. Case 1. A man aged 69, with no history of syphilis, but having syphilitic tubercles of the chest and double orchitis, was admitted under the care of M. Duplay. There was also, on admission, a tumour five finger-breadths long and four broad, situated a little below the middle of the right thigh on its inner aspect. The tumour had been growing four weeks, and was of the size of a pea when first noticed by the patient. It was hard and somewhat uneven. The skin moved freely over it. On putting the sartorius into action, the swelling was found to be in the substance of that muscle. The tumour rapidly diminished in size under mercury and iodide of potassium, but the syphilide and the testes remained unchanged. Case 2. A woman, aged 27, applied for relief on account of a tumour of the left cheek, which she had first noticed five months previously. On examination a hard swelling was found just above the insertion of the masseter into the lower jaw. The tumour was movable when the masseter was relaxed, but fixed when that muscle was contracted. There was also another swelling at the sternal insertion of sterno-mastoid. No other signs of syphilis could be discovered. Under treatment by mercury and iodide of potassium, both swellings gradually disappeared. There was no history of syphilis in this case.—*Lond. Med. Record*, Feb. 15, 1881.

Treatment of Burns.

ZELTWEG, as physician in chief to a large iron mining and smelting company in Styria, has cases of burns very frequently presented for treatment, and has found the following method most successful: The wound is first cleaned (without opening the blisters), then disinfected with a 2 per cent. solution of carbolic acid, and covered with a thick furniture varnish prepared from linseed oil and litharge, in which 5 per cent. of salicylic acid has been dissolved by warming. The varnish is allowed to dry and another coat applied; over this a layer of Bruns's cotton is placed, about 2–3 centimetres in thickness. The wound seldom suppurates, generally healing under the varnish, which is finally removed as a dry pellicle, no change of the dressing having been necessary. Should, however, suppuration

be indicated by the setting in of fever, or by the occurrence of painfulness, the dressing is removed from this locality; if the spot be not over 5 centimetres in diameter, nothing further is done than to strew the moist surface with dry powdered salicylic acid; if larger, an opening is cut in the dressing, the salicylic acid is applied as before, and then covered with a fresh layer of cotton. The scurs become by this method entirely smooth, white, and are not hypertrophied.—*Lond. Med. Record*, Feb. 15, 1881, from *Prager Med. Woch.*, Oct. 27, 1880.

Sudden Death in Gangrene from the Passage of Putrid Gas into the Heart.

In 1867, Dr. PARISE sent a communication to the Academy, which was accidentally left unpublished, but is now placed on record in the *Archiv. Gén. de Méd.* (November, 1880). Parise observed several cases of sudden death in gangrene of the limbs, and in each instance believed that the fatal termination was brought about by the entrance of putrid gas into the veins, and hence into the heart. Maisonneuve had previously (in 1853) published several cases of rapid gangrene, with the development of putrid gas in the veins of the affected member. But he believed that death was caused by blood-poisoning from this source. Parise, however, affirms that the putrid quality of the gas determines no septic action, but produces death in the same way that air accidentally entering the veins does. In the cases reported by the author the necropsies were made soon after death, and a very careful examination revealed the abundant presence of putrid gas in the right side of the heart and the principal venous trunks. Parise concluded, from the study of his cases, that surgeons should be on their guard against sudden accidents, especially in those cases of gangrene which follow a violent traumatism. Prompt action was necessary. Immediate amputation was the best curative procedure, and should be resorted to unless positively contraindicated by the condition of the patient. In the latter case deep incisions might prove beneficial; or the principal vein might be ligated or merely compressed. Amputation below the point of ligation or compression would have to be performed sooner or later.—*Lond. Med. Record*, Feb. 15, 1881.

Excision of the Stomach.

On the 29th of January Professor BILLROTH, of Vienna, excised about six inches of the greater curvature of the stomach, including the pylorus, for infiltrating carcinoma. The patient was a woman aged forty-three, mother of eight living children, who was suddenly seized with grumous vomiting last October. Marked symptoms of cancer of the stomach and stenosis speedily followed. The operation was decided on in consequence of incessant and uncontrollable vomiting which threatened inanition. The operation lasted one hour and a half. There were extensive adhesions to the omentum and colon. Fifty silk sutures were used to unite the duodenum and the remaining portions of the stomach. On the 5th inst. (a week after the operation) the sutures were removed from the external wound, which had united without reaction. The patient was doing well, and was able to take coffee, tea, and other light nourishment. This is the second time the operation has been done. M. Péan did it in 1879, removing a carcinomatous pylorus. In that case catgut ligatures were employed. The patient died on the fourth day.—*Lancet*, Feb. 12, 1881. The case is fully reported in the *Wiener Medizinische Wochenschrift*, Feb. 5, and current number of the *Medical News and Abstract*.

On Nephrectomy.

Professor HERMANN LOSSEN, of Heidelberg, reports (*Deutsche Zeitschrift für Chirurgie*, Band xiii. Heft 3, 4) an important case of successful removal of

a sarcomatous kidney, from a woman in the third month of pregnancy. The patient, who was 37 years of age, and the mother of eight children, applied for the treatment of a rapidly enlarging, though painless, swelling of twelve months' growth, in the right side of the abdomen. On examination, this was found to be a round tumour, of the size of a child's head, of firm consistence, and freely movable, as far as the median line. A second tumour, that could be felt just above the symphysis pubis, was formed by the enlarged uterus. There had not been any menstrual discharge during the previous ten weeks. The urine was normal as to quantity, and quite clear. The case was diagnosed as one of tumour of the right ovary, and Professor Lossen proposed to operate when the patient had passed into the fourth month of pregnancy. In consequence, however, of rapid increase in the size of the growth, it was found necessary to attempt its removal after an interval of three weeks from the first inspection. The tumour, after incision of the linea alba from the umbilicus, was found lying behind the posterior parietal layer of the peritoneum; its surface was of a bluish-white colour, and traversed by enlarged veins. After careful dissection, a portion of the small intestine being drawn outwards through the external wound, and protected by carbolic-acid compresses, it was made out that the growth was implanted by a broad base on the convex margin of the right kidney, which viscus had a very long pedicle. Immediately after excision of the tumour, together with the kidney, there was profuse hemorrhage from the pedicle, in consequence of slipping of a provisional ligature. The bleeding having been arrested for a time, through compression of the abdominal aorta, the pedicle was taken up, and secured by a Spencer Wells's clamp. The operation was performed, and the abdominal wound subsequently dressed, with attention to all the details of the antiseptic method. The patient ultimately made a good recovery, and was able to return to her home in the sixth week after the date of operation. The progress towards recovery, however, was interrupted by abortion, commencing three hours after the operation, and by subsequent septic endometritis, which was promptly and heroically treated by intra-uterine injections of a 5 per cent. solution of carbolic acid. The clamp was removed on the fourteenth day. The quantity of urine, which was much reduced soon after the operation, rapidly increased, and attained its normal amount. On the second day after that of the operation, 670 cubic centimetres were passed during twenty-four hours; on the eighth day 1000 cubic centimetres, and on the eleventh day 1500 cubic centimetres. This, like the first case of nephrectomy, performed by Gustav Simon, shows how rapidly a healthy kidney may take on the functions of the fellow organ.

The tumour, which presented the microscopical characters of angiosarcoma, was inclosed in a tough fibrous capsule, continuous with the capsule of the kidney. This organ seemed to be quite healthy; and, on transverse section through the kidney and tumour, a marked difference was presented between the firm, dark red, and striated structure of the former, and the soft, medullary, and pale structure of the morbid growth. There was a distinct boundary line at the surface of the kidney, and it was evident that the tumour had originated, either in the renal capsule, or in the superficial portion of the renal cortical substance. From the abnormal length of the renal pedicle, and the extreme mobility of the diseased organ, the author is disposed to regard this as a case of malignant disease attacking a floating kidney.

Professor Lossen states that this is the second case of successful extirpation of a solid renal tumour. The first case, which resembled this in many respects, and was also one of angiosarcoma, has been reported by Dr. A. Martin, in the *Berliner Klinische Wochenschrift*, No. 22, 1879. There can now be no doubt, it is asserted, that the condition of pregnancy need not prevent the surgeon from

operating for the removal of an abdominal tumour. Of fourteen cases, collected by Olshausen, of ovariectomy performed on pregnant women, death occurred in two only, and in four only of the survivors was the pregnancy interrupted. In the present case, it was intended to postpone the operation until the fourth month, in order to avoid abortion, but it was found necessary to attempt the removal of the rapidly growing tumour before the expiration of the third month. Even under these conditions, there seemed to be a fair chance of preservation of the fœtus. The woman, who had given birth to eight children, was strong and healthy, and the uterus was not exposed during the operation. The abortion, which commenced about four hours after the operation, was very probably due to shock and loss of blood, and to temporary compression of the abdominal aorta, exciting contractions of the uterus.—*London Med. Record*, Jan. 15, 1881.

Supra-pubic Cystotomy.

There will always be considerable interest attaching to this operation, for in some obvious ways it is marked out as the best means of opening the bladder for the removal of foreign bodies. But the two dangers of wounding the peritoneum and of urinary infiltration have caused its abandonment in general practice, although for the removal of very large stones it is still sometimes employed. PETERSEN, in the *Arch. für Klin. Chir.*, has recently drawn attention to plans by which he hopes both of these dangers may be minimized, and the operation brought into more general use. He supports Braune's observation, that if, after the bladder is distended, the rectum is also distended, the bladder is so pushed up and forwards that the peritoneum on the apex of that viscus looks upwards rather than forwards; and in two cases thus operated upon the serous membrane was not even seen, while in two others it was easily pushed up and kept out of the way of injury. To prevent urinary infiltration he has practised suturing the incision in the bladder with catgut to get union by primary adhesion. If this is attempted the operation must be conducted with special precautions; the incision in the bladder must be free, and no dilatation of the wound practised either in introducing the forceps or removing the calculus; for all dilatation means greater or less bruising of the edges of the wound, which will entirely prevent union by first intention. We are not surprised therefore to read that in his last case Petersen was not successful in procuring this favourable healing of the wound. Stitching up wounds in the bladder with catgut is not a novel procedure, and Mr. Heath raised the subject for discussion at the Clinical Society a few years ago in connection with a case of rupture of the peritoneal surface of the bladder, in which he had followed out this practice. The case is not strictly analogous to that we are noticing, but near enough for rough comparison. Petersen formulates the conditions suitable for the "high operation": (1) large hard stones; (2) encapsuled stone or stones lodged in sacculi behind the prostate; (3) hypertrophied prostate; (4) hæmorrhoids; (5) very fat people; (6) tumours of the bladder; and (7) impermeable stricture where it is desired to pass a fine catheter from the bladder along the ureter.—*Lancet*, Feb. 26, 1881.

Treatment of Vesical Catarrh by Establishing Urinary Fistulæ.

In hopeless cases of chronic cystitis it has occurred to Dr. D. HAYES AGNEW, that the life of the patient might be made comfortable by separating the connection of the ureters with the bladder and bringing them out through the abdominal walls, establishing fistulæ either in the iliac or in the lumbar region, and thereby diverting the urine entirely from the bladder. That such a route

for the escape of the urine is not so objectionable as might be supposed will appear from the experience of two persons in this city who suffer from urinary fistula occasioned by accident, one of whom is able to attend to his occupation—that of a daily labourer—by swathing the body with a thick roll of bandages, by which the urine is absorbed. If the fistulæ were favourably situated, mechanical appliances might be constructed in which to receive the urine.

The feasibility of the procedure proposed, Dr. Agnew has satisfactorily verified by dissection and operation on the cadaver. At first he supposed the proper route to the ureters would be through the loin, as in lumbar colotomy; but the colon on each side is an obstacle which cannot readily be overcome. The plan which he pursued was to make an incision beginning one inch below the anterior extremity of the last rib, and terminating two inches below the anterior superior spinous process of the ilium. After dividing the skin, superficial fascia, external and internal oblique and transversalis muscles, the transversalis fascia is next broken up, together with the loose tissue connecting the peritoneum with the iliac fossa. It only remains to detach carefully the serous sac until the primitive iliac vessel is reached, at the bifurcation of which into external iliac and internal iliac the ureter will be found to pass into the pelvis. Following the tube down, it should be severed as near to the bladder as possible, two ligatures having been previously applied (the lower one catgut), and the division made between the two threads. To relieve any tension on the ureter, a puncture is next made through the parietes a short distance above the upper angle of the wound, and the urinary duct piloted through by means of a probe secured to the end of the ligature previously attached to the ureter. It only remains to detach the thread from the duct and to secure the latter by two stitches to the external opening, after which the main wound can be closed. It would not be proper to operate on both ureters at the same time. The patient should be allowed to recover from the first before proceeding to the second. Nor would such a surgical procedure be advisable if there was reason to believe that the kidneys were seriously implicated.—*Phila. Medical Times*, Feb. 12, 1881.

— Carden's Amputation.

The thirty-fifth number of the *Centralblatt für Chirurgie* contains a report by Dr. P. KRASKE, of Halle, on the results from Carden's or the trancondyloid amputation of the thigh, obtained in Volkmann's clinique during the past seven years, and since the introduction of the antiseptic method into surgical practice. In this report, it is pointed out that what was alleged to be a very favourable condition of the operation when first proposed, need not at the present day be taken into consideration in any judgment of the value of the proceeding. Before the antiseptic period in surgery, the chief advantage of Carden's method of amputation consisted in the fact that, as the medullary canal was not exposed, the risks of osteo-myelitis were thus much diminished. Now, however, where Lister's practice is carried out, no distinction can be made, with regard to the resulting mortality, between amputations which do and those which do not expose the medullary canal.

Carden's operation, though it has lost one of its special advantages, is yet to be regarded, Dr. Kraske holds, as the best amputation for the lower part of the thigh. No other is capable of affording such good *functional* results. In consequence of the length of the stump, the patient is able to walk with much ease and security; and in many instances the weight of the body, both in locomotion and in standing, can be supported on the extremity of the thigh. This extremity is very broad, and, in cases where the healing of the stump has progressed favourably, is covered by healthy and intact skin. The cicatrix in such favourable instances

is situated on the posterior surface of the stump, where it is protected against pressure.

Though in many of his cases Volkmann has observed a very useful stump after Carden's amputation, the results of the operation in this respect are not always so satisfactory. The extremity of the stump is often very tender, and the patient is unable to bear any pressure on it during locomotion. This condition is almost always the result of mortification of the anterior flap, which, unfortunately, often occurs after the operation, especially in old and debilitated subjects. When the whole or a considerable portion of this flap has been destroyed through sloughing, a broad adherent cicatrix is formed, rendering the stump almost useless, and often necessitating subsequent resection of the bone.

In order to guard against sloughing of the anterior flap, the author thinks it better to take a shorter flap from the front of the limb, and to dissect out from the popliteal region a flap extending as far downwards as the head of the fibula. Both flaps, which are formed of skin only, having been turned upwards, the leg is to be separated at the knee, and the patella then removed. The femur should be sawn through at the thickest part, and its sharp margins, especially in front, be rounded off by bone-pliers. If the synovial pouch under the extensor muscles extend far upwards, an incision should be made into it at its upper extremity, and a drainage-tube be passed from the surface of the limb. A small piece of drainage-tube is inserted at each angle of the wound, and care is taken to maintain the anterior flap in close contact with the whole of the sawn surface of the femur.

In all the cases of Carden's amputation performed by Volkmann during the past three years, the treatment of the wound has been strictly antiseptic. In several instances the result was fatal, but in most of these death was due to the association of multiple injuries, or of other complications. In not a single case treated according to Lister's method, did phlegmon, diffuse suppuration, or erysipelas occur.

When the stump has so far healed as to permit the patient to move about with the aid of some artificial support, use should at first be made, according to Dr. Kraske, of an ordinary wooden leg with a bucket, the pressure of which must be received at the tuber ischii, and within which the stump for a time is allowed to hang freely. Pressure should then be gradually applied to the extremity of the stump, by inserting at intervals at the bottom of the buckets successive layers of wadding or of leather. It is regarded as a point of much importance that the patient should commence as soon as possible to go about, and to use his stump as an agent of support. It is only by early exercise of the stump, that atrophy of the bone, and consequent uselessness of the extremity, can be prevented.

During the past seven years, Volkmann has in thirty-two instances performed Carden's amputation under antiseptic conditions. In twenty-five of these cases the result was successful, and the patients, nine of whom were between fifty and eighty-four years of age, made good recovery. In three of the seven fatal cases, death was due to severe multiple injuries, necessitating double amputation, in one case to tetanus, in two cases to exhaustion through prolonged suppuration, and in the last case to gangrene of the stump and secondary hemorrhage from the main artery.—*London Med. Record*, Jan. 15, 1881.

Ogston's Operation for Knock-knee.

In the Medical Society of Leipzig, Feb. 10, 1880 (*Berl. Klin. Woch.*, Dec. 13, 1880), Herr GRAEFE exhibited two cases of genu valgum. One had been operated on twelve weeks previously, and recovered perfectly under antiseptic treatment. The patient was allowed to walk in seven weeks, and, though he

still wore a metal splint for precaution's sake, he could use the limb without any uneasiness, could bend the knee to 120 deg. actively and passively, and Herr Graefe, who was treating him with daily passive movements, expected a much greater mobility. The second patient was operated upon for genu valgum of the left side two years ago, at the age of sixteen, and remained in hospital about eight weeks. The cure was satisfactory, the motion good, and he at once resumed his fatiguing occupation of house-servant. No splint was used, yet the patient felt no harm. Flexion and extension were well performed, the knee being easily bent beyond a right angle. Neither relapse nor shortening was observable; so much so that he wanted a medical certificate that an operation had been performed, to shield him from being compelled to enter the army. Herr Graefe concluded by discussing the arguments for and against the operation. The objection of its danger, in comparison with the slight inconvenience caused to the patient by his deformed leg, and especially as contrasted with other operations, was answered by the statement that, while such an operation is a folly, save under antiseptics, it is with their aid no more perilous than the other proposed osteotomies. The operation *per se* cannot be blamed for the pyæmia and suppuration that have occurred in some of the cases. It is also stated that it constitutes too serious an interference with the delicate mechanism of the knee-joint. Admitting that there is a considerable interference with the joint, it by no means follows that harm should result from this, if reasonable care be taken in the after-treatment of "Ogston-knees." Considering the short time the operation has been on its trial, it is premature to draw any conclusions; but the coming decennium, and its experience, may enable this question to be solved. It has been, in the third place, objected that the interference with the epiphysal cartilage in its linear division by the saw may impair the growth of the limb in adolescents and in rickety children. This, however, is a theoretical statement, resting on no proof whatever. It is true that total or partial destruction of an epiphysal cartilage stops the growth of a bone; but whether a linear antiseptic division of the cartilage, accompanied by mere vertical displacement, without separation of continuity, will have the same effect, is a point that future experience alone can decide. Herr Graefe's cases seem to point to this and the previous objection as being incorrect. At the conclusion of the communication, Herr Thiersch demonstrated the well-known preparation, showing the state of parts of the femur five weeks after an Ogston's operation.—*Lond. Med. Record*, Feb. 15, 1881.

Yellow Pus.

In 1854, M. Delore, of Lyons, described six cases of open wound in which the purulent discharge had been observed to be of a bright yellow colour. This condition was regarded by M. Delore as one of very serious import, as each of his cases terminated fatally through pyæmia. M. VERNEUIL, in a recent contribution (*Arch. Génér. de Méd.*, No. 12, 1880) on this discolouration of pus, which he terms *suppuration orangée*, states that he has had many opportunities of observing it during the past twelve years, especially in 1870, during the siege of Paris. These cases, though not all fatal, yet confirm the opinion of M. Delore as to the gravity of the yellow staining of pus as a prognostic indication. This staining, M. Verneuil holds, is a serious phenomenon, not so much in consequence of any intimate relation that it bears to pyæmia, as from its being indicative of some dyscrasia. The phenomenon of bright yellow suppuration has been observed most frequently in cases of extensive laceration and contusion of the soft parts of a limb, in association with comminution of bone. It usually occurs on the fourth or fifth day, and after the commencement of sloughing. It is, as

a rule, a very transient phenomenon, and lasts but for two or three days. The staining is not diffused, but is due rather to the abundant presence in the pus of small and soft flakes of a bright-yellow colour. According to M. Robin, the yellow staining is the result of the presence of hæmatoidine and reddish-yellow amorphous colouring matter. The late M. Broca endeavoured to establish an analogy between yellow and blue suppuration by means of cultivation experiments. These, however, whilst they invariably succeeded with blue pus, always failed with yellow pus. M. Verneuil has been led to seek for the predisposing cause of yellow suppuration in some constitutional affection of the patient. In his earlier cases that were observed in the crowded hospitals of Paris during the siege and the rule of the Commune, he found, in almost every instance, that the patient had been a drinker, and he was thus at first disposed to regard alcoholism as the sole predisposing cause of the staining. In some more recent cases, however, in which suspicion could not be entertained, he was able to establish clear histories of other dyscrasiæ. Some of these patients were diabetic, others were the subjects of phosphaturia, and in one case the patient was suffering from the effects of repeated administration of morphia. It is concluded that yellow suppuration results from the association of certain forms of wound with a certain class of abnormal constitutional condition. With regard to treatment, M. Verneuil simply points out that this staining of purulent discharge indicates the necessity of frequent cleansing of the wound, and of directing attention to the state of the patient's constitution.—*London Med. Record*, Feb. 15, 1881.

OPHTHALMOLOGY AND OTOTOLOGY.

Pterygium.

The etiology and pathology, no less than the treatment of pterygium, have long presented considerable difficulty to ophthalmologists. The affection, indeed, is apparently a slight one in itself: nevertheless, its tendency to encroach on the cornea, and thus seriously to interfere with vision, coupled with the fact that the operation for its removal is frequently followed by recurrence, besides being in itself not wholly free from danger, give it a greater importance than might otherwise be claimed for it.

A variety of theories have prevailed as to the etiology of pterygium since the time of Searpa. At the present moment the generally accepted view is that first propounded by Arlt, and subsequently more thoroughly worked out by Horner. According to these observers, in every case of true pterygium either a primitive ulcer or a patch of ulcerated herpetic vesicles has at one time existed at the margin of the cornea. In this way the protecting epithelium, and probably the membrane of Bowman, have been destroyed, and a granulating surface has been left, to which the conjunctiva has in time become adherent. Under the influence of cicatrization, it has subsequently become stretched and hypertrophied, and in this way has formed the body of the pterygium, between which and the sclerotic new layers of epithelium are later on to be developed.

This theory may suffice to account for the fact that pterygia are often found adherent by one point only to the cornea, while in the remainder of their course they rest on the conjunctiva beneath, though not in any way connected with it, save at their immediate origin. It leaves, however, quite untouched the problem of their steady onward growth towards the centre of the cornea, and of the tendency they exhibit to recur after removal.

Some recent researches of Professor PONCET, of Cluny (*Archives d'Ophthalmologie*, No. 1), are probably destined to throw a good deal of light on these points. This observer, having had occasion to examine after death a pterygium in an otherwise perfectly healthy eye, discovered the presence of large numbers of vibrios and spores within the ulcerated *cul-de-sac* upon the cornea, and under the cicatricial fold of conjunctiva. The microcosms in this case could not, on account of the minute precautions taken, be looked on as due to *post-mortem* changes. Hence, they must have existed during life, and if so, their presence in the peculiar situation in which they were found would seem to afford a solution of many of the pathological difficulties connected with the growth and recurrence of pterygium.

According to Professor Poncet, these parasitical microcosms form a nidus beneath the folds of conjunctiva, and thereby maintain a condition of extremely chronic irritation. They work, as it were, underground, removing the fibrous tissue, atom by atom, surreptitiously, and without any visible inflammatory reaction, destroying the epithelium, and penetrating between the laminae of the cornea, which probably offer less resistance to their corroding action than do the tough interlaced fasciuli of the sclerotic. Their progress is most manifest in the cornea, because the condition of that membrane is altered by the changes they induce, and is thereby rendered opaque. In the cornea the anatomical arrangement of the parts serves to account also for the fact that the vibrios do not spread over it entirely, but as a rule stop short of its centre. The cause of this lies in the arrangement of the corneal lymphatic vessels, the course of which they may be supposed to follow. The lymphatic vessels of the conjunctiva, as Waldeyer has shown, advance singly to the corneal limbus, and there form by the union of two or three branches a triangular plexus, offsets from which anastomose with the canaliculi, and form the summit of the corneal lymphatic triangle.

Thus far as to the shape and slow non-inflammatory growth of the corneal portion of the pterygium. As regards its large triangular body, a parasitical origin cannot be so distinctly shown. Its presence is more probably due, according to Poncet, to long-continued irritation, owing to a development of epithelial cysts within the folds of hypertrophied conjunctiva. Once the conjunctiva has formed a longitudinal fold, this elevated portion becomes extremely liable to irritation and hypertrophy from external causes. The change of the superficial epithelium into a cylindrical or calyciform variety, its grouping in pouches like racemose glands, the development of acini, all point to the genesis of a neoplastic growth, destined probably to lubricate the irritated mucous membrane. This modified epithelium fulfils a function similar to that of the sclerosed tissue on which it rests, namely, to facilitate the motions of the palpebral conjunctiva over its surface.

The therapeutic importance of the discovery of a possibly bacterian origin for pterygium will be at once evident. The treatment of the affection may henceforth be subdivided into the treatment of its corneal or smaller portion and its conjunctival or larger. For the first, the object must be to thoroughly free the cornea from the parasites which infest its superficial laminae immediately around the limbus. Nothing short of the complete removal of the superficies of the affected portion will suffice. There need not be the least hesitation felt in carrying out this treatment thoroughly, inasmuch as, owing to the destruction of the membrane of Bowman by the ulceration which already exists, the cornea can never under any circumstances regain its transparency. Antiseptic dressings and immediate application of boracic acid, or weak solutions of carbolic acid, are also necessarily indicated. As regards the conjunctival portion, complete removal is demanded, not merely of the triangular and affected portion, but also of the

modified epithelium, which is found at a distance of two or three millimetres on each side of it. Whatever be the method of removal adopted, whether transplantation or abscission, care must be taken that the edges of the wound, when brought together by sutures, are clothed with perfectly normal and healthy epithelium.—*London Med. Record*, Feb. 15, 1881.

MIDWIFERY AND GYNÆCOLOGY.

Version during Labour by External Manœuvres.

M. LABAT relates (*Ann. de Gyn.*, Jan. 1881) two cases in which he performed version during labour by external manipulations. He says that whenever a presentation less favourable than the vertex is made out during labour, version by external manœuvres should be attempted if the fœtus be mobile. It must be remembered, however, that moderation must be observed in the manipulations. Rupture of the uterus might result from forcible efforts to turn the child. During labour, the uterus is less tolerant of interference, and its walls do not support pressure so well as during pregnancy. In the two cases recorded by Dr. Labat, no precaution, such as the application of Dr. Pinard's eutocic belt, was adopted to secure the vertex presentation obtained. This was because the contractions of the uterus at once fixed the head in the brim. Dr. Labat concludes: 1. Version by external manipulation is possible in certain cases during labour; 2. When the situation of the fœtus is transverse, and the placenta is inverted near the os uteri, cephalic version by external manipulation renders the hemorrhage less severe; 3. When cephalic version is impossible, pelvic version should be resorted to; 4. During labour, the application of the eutocic belt is not always necessary. [The eutocic belt is designed by Dr. Pinard, in the form of a modified binder, to apply round the abdomen to retain the head on the brim of the pelvis after external version has been performed. Dr. Pinard thus secures a head-presentation weeks before the labour sets in.—*Rep.*]—*London Med. Record*, Feb. 15, 1881.

Can Syphilis acquired by the Mother during Pregnancy be Transmitted to the Child in Utero?

Dr. VAJDA enters at considerable length (*Wien. Medizin. Wochens.*, Nos. 30, 32, 1880) into this question, touching on many of the cases hitherto recorded which bear on the point. He comes to the conclusion that a mother can infect her offspring *in utero*, and doubts the correctness of the view which holds that a mother can produce a syphilitic child without being herself syphilitic. The following illustrative case is given. Between the 20th and 24th of June 1878, a man contracted syphilis and returned to his wife, who was at that time in the fifth month of pregnancy. On August 10th, Vajda examined the wife, and found her healthy; she became infected on September 9th, and on October 17th a hard chancre and indolent glands were present. The child was born at term, but a papular eruption appeared seven weeks after birth. Psoriasis and pustules followed. The author states that extra-uterine infection could be excluded in this case, as well as a previous attack of syphilis in either parent.—*London Med. Record*, Feb. 15, 1881.

A Series of 172 Antiseptic Abdominal Sections.

Mr. KNOWSLEY THORNTON, at a late meeting of the Royal Medical and Surgical Society (*Lancet*, Jan. 15, 1881), read a paper "on 172 antiseptic abdo-

minal sections, with remarks on the causes of death in the fatal cases," of which the following is an abstract:—

After some remarks as to the details given in the printed tables which accompanied the paper, the author pointed out certain further information which it is desirable should accompany statistical tables of operation cases. First: an account of all cases of abdominal tumours seen during the time covered by the tables, but not operated upon, with the reasons why no operation was performed. Second: the highest temperature and pulse, with the day of the operation upon which they were respectively recorded. Such additional information is necessary in order to show the success of the individual surgeon in dealing with ovarian or other similar disease, and the general progress in this branch of surgery, and also to show the well- or ill-doing of the cases which recover after operation. The fact that all the cases had been treated on Lister's method, and nearly all by the complete intra-peritoneal ligature, was dwelt upon. Common methods of treatment in a large series of cases being especially useful in extending knowledge by affording material for comparison with other methods, the importance of accurately following the teachings and practice of Lister, to the exclusion of so-called "modified Listerism," was insisted on. In the author's hands the *pure Listerism* had reduced the mortality in the most common operation in the tables—ovariotomy—from 23.94 per cent. to only 4 per cent., a result altogether beyond the mere improvement to be expected from increased experience in performing the operation.

The question of drainage, by means of Keith's improved form of Koeberlé's glass tube, was then discussed, the small mortality in the last 75 ovariectomies (4 per cent.) being claimed as a proof that drainage is unnecessary if Lister's method be perfectly carried out in abdominal section, comparative statistics being given to prove the same conclusion. The question of selection of cases was alluded to in relation to two of the three deaths in the last series of 75 cases; both were apparently hopeless, but were given the last chance; and both, though open to question as to completion, were included among the complete operations. The question as to what cases should be called complete or incomplete was then discussed.

A comparison of the mortality in simple and difficult cases (it is *nil* in the author's hands in the former), in the cases tapped and not tapped, and in those which had only one or both ovaries removed, was also given. The causes of death in the fatal cases were then given in some detail, and the bearing of the antiseptic method on the mortality was illustrated by a division of these cases into three groups. The danger arising from the transfixion or opening of a diseased Fallopian tube was pointed out as a possible cause of septicæmia—a question also important in dealing with uterine fibroids. The incomplete ovariectomies and other operations in the tables were discussed, and, passing to the treatment of uterine tumours by abdominal section, the author pointed out the difficulties in the application of Lister's method to those cases in which the uterine cavity is opened, and showed from his own statistics that, whereas in cases in which the cavity was not opened the mortality was only one in eight (and that one a very exceptional case in many respects), in cases in which the cavity was opened three out of four died.

The general conclusions drawn from the whole 172 antiseptic cases were as follows: 1. Simple cases recover under Lister's method, with a certainty previously unknown. 2. There is less fever, and convalescence is more rapid, than under the old method. 3. The success obtained in the more complicated cases is in proportion to the exactness with which the antiseptic method can be applied to the individual cases. 4. The accidents and complications occasionally following ope-

ration, such as hemorrhage, for example, are more easily overcome in aseptic cases. 5. There are difficulties and some dangers in the application of the method, and the more experience the individual surgeon has in it, the more readily he foresees and avoids these, and the more complete becomes his success in applying it. In a few concluding words the author pointed out how much peritoneal surgery owed to Mr. Lister, and how much more to Mr. Wells; without the untiring energy and success of the latter it would never have been in the position to benefit by the method of the former.

Dr. BANTOCK began by referring to the debate which had taken place at the last meeting of the Society, and criticizing the remarks made by Mr. Thornton on that occasion. He maintained that his own experience, though comparatively small, was sufficient to prove the inefficiency of Listerism. Mr. Thornton's reference to his (Dr. Bantock's) hospital statistics before they had been published was unusual, and if, instead of quoting the last year's figures, he had given those of the previous year, he would have found that the rate of mortality as between his cases and Mr. Thornton's was reversed. The opinion he held that carbolic acid was injurious was shared in by many, for some of the most eminent Continental surgeons had attributed fatal results to its use. In considering the subject of drainage it must be remembered that drainage is always applied to the most severe cases, and to say that in such cases death is due to the use of the drainage-tube is to beg the question. In his own practice the daily diminution of the discharge showed that the drainage-tube did not excite suppuration; and the specimens of fluid he showed on the last occasion proved this, for they were perfectly aseptic. He believed tapping to be most injurious, and would say that it should never be done unless the operator were prepared to follow up the procedure by removal of the cyst. It was harmful, not because of its liability to cause septic poisoning, but because of its leading to inflammatory changes in the cyst. He had removed a cyst (not previously tapped) where the fluid was putrid; the drainage-tube was used, and the temperature fell at once after the operation. He did not believe at all that septic matter could be introduced through tapping. That suppression of urine was more frequent since antiseptics had been used was shown by the fact that it was only once met with by Mr. Spencer Wells in 800 cases; and he himself (Dr. Bantock) never had a case of suppression until he adopted the Listerian method. Dr. Keith's statistics, showing a mortality of 1 in 26 without antiseptics and 1 in 24.5 with antiseptics, were significant. Dr. Bantock concluded by showing that the consumption of ice at the Samaritan Free Hospital had risen considerably since Mr. Thornton's introduction of the ice-cap and his employment of Listerism, and he thought this fact was opposed to Mr. Thornton's statement that there was less fever since the adoption of Listerism than before.

Mr. HULKE asked Mr. Thornton if he would state precisely what he meant by Lister's own method. Mr. Lister had, no doubt, greatly modified his method, and it would be satisfactory to know exactly the details as now carried out.

Mr. THORNTON said the procedure was as follows: The abdomen is washed by the nurse before the operation with a 5 per cent. solution of carbolic acid, and a cloth soaked in this solution is lightly bandaged on until the operation begins. All the instruments, ligatures, etc., are placed in trays containing this solution, which is diluted with warm water to $2\frac{1}{2}$ per cent. shortly before the operation. The strength of the solution in the spray bottle is also 5 per cent., which is diluted by the steam of the spray-producer to about $2\frac{1}{2}$ per cent. The sponges (always well cleansed after each operation by ammonia and by sulphurous acid—1 in 8) are kept in a 5 per cent. solution, and during the operation are washed in warm water, and then in a $2\frac{1}{2}$ per cent. solution. Gauze is applied directly over

the wound, is strapped on, and not removed until ten days after the operation, by which time the wound will (in 99 cases out of 100) be found healed by the first intention, so that it is not necessary to use the spray in removing the ligatures. Gauze is again put on, and the patient goes out with the wound quite healed.

Mr. HEATH congratulated Mr. Thornton upon the plain way in which he had given the facts of all his operations—especially for including his uncompleted operations in his tables. But why were no cases given beyond June last? Ten years ago he held office at the Hospital for Women and performed and witnessed many ovariectomies. He had been pleased to find that Mr. Wells and his colleagues at the Samaritan Free Hospital had come round to the views which were then held at Soho-square, viz., that preliminary tapping was bad, and that ligature was the best method of treating the pedicle. The results they then had were very good. It was remarkable that in all Mr. Thornton's fatal cases there were adhesions; for this proved the truth that if the case be a simple one it does well. Ovariectomy might be compared with lithotomy, where, if the stone be a large one, the chances are against recovery. So in ovariectomy, if the cyst be very adherent, the chances of a fatal result are the same whether the case be treated by drainage or by antiseptics. Therefore he believed that as good results might be expected without the use of the spray as with it; and in his own experience the wounds healed readily; far different from the cases where the clamp was used, when patients used often to go out with the wound unhealed.

Dr. HEYWOOD SMITH, alluding to the removal of uterine fibroids, especially of the intramural class, when symptoms are more urgent, asked whether in such cases oophorectomy should not be practised, as it seems to give some hope of the arrest of growth of such tumours. The introduction of antiseptics had certainly reduced mortality in cases of old vascular adhesions, which before the days of antiseptics were often a source of danger from the oozing of blood into the peritoneum.

Dr. CHAMPNEYS pointed out that statistical tables dealing only with ovariectomy were somewhat misleading, for they take no account of those cases which are passed over as unfit for operation, and which by rights should be placed on the side of the fatal cases. Every encouragement should be given to surgeons to operate in all doubtful cases, disregarding the influence this might have in raising the rates of mortality; for cases were met with in which after death it was seen that the tumour could easily have been removed.

Mr. THORNTON disclaimed any intention of entering into a repetition of the debate which took place at the last meeting. The statistics he then quoted from Dr. Bantock's practice had been mostly published by that gentleman in a letter to one of the medical journals. The apparently excessive consumption of ice, on which such stress had been laid, arose from the great waste due to the storage of ice at the Samaritan Free Hospital; and it was not found to be necessary to keep such a supply now, for the ice-cap was very rarely used. He did not think anything would be gained by entering into controversy on the matter after the exhaustive debate at the last meeting, but preferred to wait until fresh facts were brought before the Society. If the fluids shown by Dr. Bantock were really aseptic, it would prove that the air of the hospital—and, indeed, the air of London—was purer than the air of Mont Blanc when Professor Tyndall made his experiments. He no longer used any "protective," for Mr. Lister does not use it for wounds of which the edges can be kept in apposition. The reason why the tables included no cases of the past six months was simply that the paper had been written for some time, and included other abdominal sections up to that date (June). He did not imply that all the bad cases died—indeed, under antiseptics a large percentage of bad cases recover. He agreed with Mr. Heath as

to the inutility of tapping, and the value of ligatures, and had early come to that conclusion when seeing cases treated by tapping and by the clamp. He hoped that some day the subject of operation for uterine fibroids would be discussed. He had avoided mention of oöphorectomy—an operation which he was sorry to see was being coupled with ovariectomy, whereas it was a far simpler measure, and the indications for its performance had yet to be defined.

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A New Method of Performing Ovariectomy.

At a late meeting of the New York County Medical Society, Dr. EMIL NÖGGERATH read a paper entitled as above, of which the following is an abstract:—

Having spoken of the three principal sources of danger—hemorrhage, shock, and septicæmia—each alone, or two or more combined, constituting the most frequent cause of death, the writer considered the question how to avoid shock. From Wegener's experiments on animals, and from clinical observations, which had been made since then, it could be assumed that the principal element of shock was lowering of temperature. Since so large a surface was exposed to evaporation, it could readily be seen how this cause would operate in ovariectomy. Another element in the production of shock was the prolonged contact of the contents of the abdomen with fingers, instruments, etc., and their unavoidable dislocation; a fact also proven by experiments on animals. If we added to these the influence of narcotism, with its paralyzing effect on the heart, its well-known tendency to lower the temperature of the body, and the injurious effect of vomiting, which added to the mechanical insult offered to the viscera, he thought he had enumerated all the circumstances, a combination of which rendered laparotomy dangerous from this source. Beginning with the last, he then gave an account of the manner in which he attempted to prevent shock. After a long trial with the usual anæsthetics, he had returned to the use of chloroform, first, because he had failed in a number of instances to produce deep and uninterrupted sleep with ether; and, secondly, because nausea, vomiting, and coughing during and after the operation had been less frequent after the use of chloroform. A patient to be operated upon in the afternoon of a certain day was ordered to take on the day previous, and the one preceding this, one drachm, and on the morning before the operation thirty grains, of bromide of potassium, in accordance with the plan formerly proposed by Dr. Lente. The patients required less of the anæsthetic; the period of excitement was considerably diminished; the sleep was more natural; and vomiting was less frequent than without it. For the last two years he had added another safeguard also; namely, the administration of one or more doses of thirty grains of chloral per rectum; and since he had been employing bromide of potassium before, and chloral after, ovariectomy, vomiting had been an extremely rare occurrence. In order to prevent lowering of the temperature, he placed his patients on a rubber bed filled with water heated to 100° F. or 110° F. Dry heat was much less depressing than damp heat, which was almost universally employed, because it did not interfere with the evaporation from the lungs and from the skin; and it possessed the further advantage that it could be conveyed to the body in just such unvariable strength and duration as was required. Still another advantage over the old method was its effect upon the reflex centres in the spinal cord. Abdominal hyperæmia had been proved to be an essential element and a direct consequence of shock, and if we included with the reflex paralysis of the vaso-motor system that of the splanchnicus, in consequence of traumatic insult, all the phenomena were explained: the patients were pale; the brain was anæmic; the heart contained little blood, and the portal system of veins was engorged. We could, therefore, measure to a certain extent the degree of shock which was developed during ovariectomy by

the amount of hyperæmia found inside the abdominal cavity; but since he had operated with his patients on the hot-water bed he had observed that even in operations where the viscera had been exposed more than an hour and a half the abdominal blood-supply had not apparently been larger than in the normal state.

The most important danger connected with ovariectomy, he continued, consisted in the formation of septic material in the abdominal cavity after the operation; and it was evident that it must be the effort of the surgeon to allow as little septic matter as possible to come in contact with the serous membrane. The desired object would be obtained most effectively if we could lessen the space and time of contact of the peritoneum with the air, hands, and instruments from what was now the case in the method of operating ordinarily employed. Dr. Noeggerath then gave the following details of the plan which he had adopted: "I commence by incising the skin, the subcutaneous layer of fat, and the fascia superficialis to the extent of about three inches. Instead of going on incising the tissues down to and through the peritoneum, I plunge the trocar at once into the cyst and empty it out. If I find that the liquid is bland, I proceed with the operation; if it should contain pus, decomposed blood, or dark, grumous fluid, I inject through the tube attached to the trocar about half as much of a two-and-a-half per cent. solution of carbolic acid as the fluid measured when removed. This is allowed to remain in the cyst for a while and is then withdrawn. This is done in order to remove the possibility of infecting matter passing from the cyst into the abdominal cavity during the further progress of the operation. After the cyst is fully emptied I depress the handle of the trocar toward the skin below the umbilicus, thus carrying all that section of the tumour which lies below the opening of the trocar against the anterior abdominal wall. Now the uplifted portion of the latter is incised upon the trocar, as a guide down to the cyst-wall, which is lifted up and out of the peritoneal cavity by the instrument inside it, after which the pedicle is tied and the cyst removed." The advantages claimed for this proceeding over the ordinary method are the following: (1) It simplifies the operation considerably, since the search for, and separate opening of, the serous membrane are entirely done away, thus removing the principal difficulty connected with that part of the operation which precedes the opening of the cyst itself. (2) The chances of air, instruments, and hands, contaminated with septic material, entering the abdomen are considerably diminished, partly because the time during which the peritoneal cavity is exposed to their contact is shortened by just so much as it takes to empty out the sac; partly because the cyst collapses before the cavity is opened, and the suction originating from the inequable contraction of the sac and the abdominal walls is entirely done away with. (3) The chance of noxious contents of the tumour running into the abdominal cavity is very much lessened as compared with the ordinary proceeding, and they can be rendered harmless by previous disinfection. (4) The opening in the peritoneum is, on an average, smaller than with the old method, it being adapted in every single instance exactly to the requirements of the case. (5) The shock which results from laying open the abdominal cavity is shortened by just so much time as it takes to empty out the cyst, the greater part of the operation being reduced to that of simple tapping.

The only two contra-indications to this method of which Dr. Noeggerath knew were: (1) A preponderance of the solid over the liquid portion of the tumour, or where the whole mass consisted of very small cysts or semi-solid contents, too thick to pass through the canula. (2) A small sac, either originally so, or reduced by previous tapping, on account of the danger of encountering a loop of intestine in front of the cyst. A third possible contra-indication would be the presence of ascites, but he had had no occasion to test this question practically. If anything unusual should occur after commencing with his proceeding, however,

it could be interrupted at any step, and the operation finished after the ordinary method. At first sight the presence of adhesions might be taken for a grave objection, but during the operations performed after his method he had met with the ordinary run of adhesive inflammation, its products extending to the omentum, the lateral parietes and anterior surface, and spreading far into the pelvis; yet he had found no difficulty in separating them, one after another, from the collapsed sac.

Of the twelve patients upon whom the operation had been performed, three had died and nine recovered. Numerically, this was a small percentage, but of the three patients who died one was forty-five, one seventy-one, and one seventy-five years old. The two latter had evidently atheromatous degeneration of the arteries. In the case of the first of these patients only four-fifths of the cyst could be removed, on account of adhesions to the spinal column and the true pelvis. The ligature applied to the remaining mass, which he intended to treat according to the plan of Dr. Atlee, was tied in what is known as the Staffordshire knot. It slipped, and before another one could be applied a fearful hemorrhage occurred, which the woman only survived for three hours.

Before proceeding to describe his new method of after-treatment, the writer stated that in ordinary cases he left his patients for the week following the operation on the water-bed, which he now filled with cold water as soon as a rise of temperature called for anti-pyretic measures. He had found it as efficient as Kibbee's cot, and it had the great advantage over the latter of putting less strain on the nurse and causing less disturbance of the patient. If symptoms of nervous depression, or even collapse, were to begin to develop it could be filled again with hot water, and its stimulating effects thus called into action. The after-treatment properly began at the time when the cyst was being severed from its pedicle—that is to say, we had at this moment to decide whether the peritoneal wound, namely, the peritoneal cavity, was to be treated as an open wound or to be closed. Although it was generally admitted that the question regarding the treatment of the pedicle was so far settled that in the large majority of instances the intra-peritoneal method was the one to be chosen, there remained a certain percentage in which drainage was the only proper treatment. He then expressed the conviction that drainage of the pelvic cavity, as practised by surgeons at the present day, no matter of what shape or material the tube was made, was a source of danger.

The only reasonable method of drainage was that proposed and performed with great success by Dr. Bardenheuer, of Cologne, who had returned to the original idea of Sims, and drained the abdominal cavity through Douglas's cul-de-sac, with such modifications, however, as to overcome its disadvantages and dangers, on account of which it had been generally abandoned. He incised the cul-de-sac to the extent of at least an inch and a half, and introduced a tube of the size of the finger, with a number of large orifices in the supra-vaginal portion of it. To the tube there was further attached a cross-piece, also perforated, for the drainage of the base of the pelvis. But even if we had an absolutely reliable method for draining Douglas's cul-de-sac, cases undoubtedly occurred where the procedure would fail; and Dr. Noeggerath had, therefore, employed a new method of after-treatment for cases where drainage was indicated. It consisted in the use of the permanent, full bath, the water being allowed to remain in constant contact with the peritoneal cavity. The bath used for treating patients after ovariectomy consisted of a large tank made of boiler iron, joined and riveted like a steam boiler, having beneath it a chamber, of about two inches in depth, for the reception of steam, in order to maintain the temperature of the water at an equal rate without such frequent changing as would otherwise be necessary. All along and outside its upper border were projecting iron pegs for the purpose

of attaching a hammock, on which the patient lay in the water. The bath was connected with the hot and cold water-pipes, and also with the steam-pipes, and the hot and cold water was made to mingle in one common pipe before entering the tub, so that it could neither chill nor scald the patient as it ran in. Although it was desirable to have a bath as complete as the one described, it could be very well substituted in a private dwelling by a common movable bath-tub with a double bottom for the reception of hot water. The explanation of the action of the perpetual contact of water in preventing sepsis consisted in the fact, established by Wernich, that water in abundance is one of the most reliable agents for destroying bacteria. To the water was added enough common salt to make not quite a one-half per cent. solution, and a small quantity of salicylic acid. The number of cases he had treated with the bath was too small to shape any final indications for its use. He knew, however, already one contra-indication, and within its scope are comprised patients with weakened constitutions. The drain on the system from loss of serum and fibrine was severe. Dr. Noeggerath said, in conclusion, that he proposed to employ the permanent bath as a substitute for ordinary drainage in ovariectomy, and, above all, after Cæsarean section. He further stated that in the bath in one case an abdominal fistula an inch and a half in length, from which all of the solid fecal matter had been discharged for weeks, was closed in four days and a half so thoroughly that no feces were afterwards discharged through it.—*Boston Med. and Surg. Journal*, Feb. 10, 1881.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

Poisoning by Duboisin.

DUBOISIN is the alkaloid obtained from the *Duboisia myoporoides*, a plant growing in Central Australia, and an extract from which has lately been brought into Europe and submitted to experiments, the most important being those of Dr. Sydney Ringer, published in 1878. In a communication to the *Nordiskt Medicinskt Arkiv*, vol. xii., 1880, Dr. BERNER, of Christiania, relates a case of poisoning by duboisin, the subject of the experiment being himself. After a simple instillation into the eye of the solution of the sulphate of duboisin, at the end of about ten minutes his sight became dull, and objects appeared small and distant. The pupil of the eye which had not been instilled was dilated to its maximum, the accommodation was suppressed, with simultaneous photopsia and intense sensation of vertigo, accompanied with pressure of the temples as if under the influence of cold. The face became pale, the nose cold, and there was singing of the ears with deafness. The mucous membrane of the nose, mouth, and pharynx was excessively dry, with a sharp scraping sensation in the throat, but no thirst. The speech was somewhat nasal, and the respiration stertorous in the recumbent posture. Vomiting occurred twice. The respiration was frequent and superficial. The arms and legs were paretic, with a marked sensation of prostration. Dr. Berner was nearly falling as soon as he closed his eyes. At the end of an hour and a half there was a copious discharge of limpid urine. This condition, which lasted from three to four hours, was at first principally accompanied by restlessness, and afterwards by somnolence. The paresis of accommodation lasted from four to five days, gradually diminishing, and the dilatation of the pupils from five to six days. The day following the experiment, there was a little disagreeable sweat over the whole body, with depression, and irritability, and physical and moral prostration.—*Med. Times and Gazette*, Feb. 26, 1881.

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BELLEVUE HOSPITAL MEDICAL COLLEGE, CITY OF NEW YORK.

SESSION OF 1881-82.

At and after the Session of 1881-82, the College will return to its former requirements as regards fees and graduation; viz., those in force before the Session of 1880-81.

The COLLEGIATE YEAR in this Institution embraces the Regular Winter Session and a Spring Session. The REGULAR SESSION will begin on Wednesday, September 21, 1881, and end about the middle of March, 1882. During this Session, in addition to four didactic lectures on every week-day except Saturday, two or three hours are daily allotted to clinical instruction. Attendance upon two regular courses of lectures is required for graduation. The SPRING SESSION consists chiefly of recitations from Text-Books. This Session begins about the middle of March, and continues until the middle of June. During this Session, daily recitations in all the departments are held by a corps of Examiners appointed by the Faculty. Short courses of lectures are given on special subjects, and regular clinics are held in the Hospital and in the College building.

FACULTY.

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ISAAC E. TAYLOR, M.D., Emeritus Prof. of Obstetrics and Diseases of Women and Children, and President of the Faculty.	
JAMES R. WOOD, M.D., LL.D., Emeritus Professor of Surgery.	FORDYCE BARKER, M.D., LL.D., Prof. of Clinical Midwifery and Diseases of Women.
BENJAMIN W. MCCREADY, M.D., Emeritus Professor of Materia Medica and Therapeutics, and Professor of Clinical Medicine.	
AUSTIN FLINT, M.D., Prof. of the Principles and Practice of Medicine, and Clinical Medicine.	A. A. SMITH, M.D., Professor of Materia Medica and Therapeutics, and Clinical Medicine.
W. H. VAN BUREN, M.D., LL.D., Prof. of Principles and Practice of Surgery, Diseases of the Genito-Urinary System, and Clinical Surgery.	AUSTIN FLINT, JR., M.D., Professor of Physiology and Physiological Anatomy, and Secretary of the Faculty.
LEWIS A. SAYRE, M.D., Professor of Orthopedic Surgery and Clinical Surgery.	JOSEPH D. BRYANT, M.D., Professor of General, Descriptive, and Surgical Anatomy.
ALEXANDER B. MOTT, M.D., Professor of Clinical and Operative Surgery.	R. OGDEN DOREMUS, M.D., LL.D., Professor of Chemistry and Toxicology.
WILLIAM T. LUSK, M.D., Professor of Obstetrics and Diseases of Women and Children, and Clinical Midwifery.	EDWARD G. JANEWAY, M.D., Prof. of Pathological Anatomy and Histology, Diseases of the Nervous System, and Clinical Medicine.

PROFESSORS OF SPECIAL DEPARTMENTS, Etc.

HENRY D. NOYES, M.D., Professor of Ophthalmology and Otolary.	LEROY MILTON YALE, M.D., Lecturer Adjunct on Orthopedic Surgery.
J. LEWIS SMITH, M.D., Clinical Professor of Diseases of Children.	BEVERLY ROBINSON, M.D., Lecturer on Clinical Medicine.
EDWARD L. KEYES, M.D., Professor of Dermatology and Adjunct to the Chair of Principles of Surgery.	FRANK H. BOSWORTH, M.D., Lecturer on Diseases of the Throat.
JOHN P. GRAY, M.D., LL.D., Professor of Psychological Medicine and Medical Jurisprudence.	CHARLES A. DOREMUS, M.D., Ph.D., Lecturer on Practical Chemistry and Toxicology, and Adjunct to the Chair of Chemistry and Toxicology.
ERSKINE MASON, M.D., Clinical Professor of Surgery.	FREDERICK S. DENNIS, M.D., M.R.C.S., WILLIAM H. WELCH, M.D., Demonstrators of Anatomy.
JOSEPH W. HOWE, M.D., Clinical Professor of Surgery.	

FACULTY FOR THE SPRING SESSION.

FREDERICK A. CASTLE, M.D., Lecturer on Pharmacology.	T. HERRING BURCHARD, M.D., Lecturer on Surgical Emergencies.
WILLIAM H. WELCH, M.D., Lecturer on Pathological Histology.	ANDREW R. ROBINSON, M.D., L.R.C.P. & S. Edinburgh, Lecturer on Normal Histology.
CHARLES A. DOREMUS, M.D., Ph.D., Lecturer on Animal Chemistry.	CHARLES S. BULL, M.D., Lecturer on Ophthalmology and Otolary.

FEES FOR THE REGULAR SESSION.

Fees for Tickets to all the Lectures, Clinical and Didactic	\$140 00
Fees for Students who have attended two full courses at other Medical Colleges	70 00
and for Graduates of less than three years' standing of other Medical Colleges	5 00
Matriculation Fee	10 00
Dissection Fee (including material for dissection)	30 00
Graduation Fee	30 00
No Fees for Lectures are required of Graduates of three years' standing, or of third-course Students who have attended their second course at the Bellevue Hospital Medical College.	

FEES FOR THE SPRING SESSION.

Matriculation (Ticket valid for the following Winter)	\$5 00
Recitations, Clinics and Lectures	35 00
Dissection (Ticket valid for the following Winter)	10 00

For the Annual Circular and Catalogue, giving regulations for graduation and other information, address Prof. AUSTIN FLINT, JR., Secretary, Bellevue Hospital Medical College.

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